

STATEMENT ACCOMPANYING SEQUENCE LISTING

The sequence listing does not include matter that goes beyond the disclosure in the international application.

The printout of the attached Sequence Listing is identical to the computer readable sequence listing on the enclosed computer disk.

SEQUENCE LISTING

10/533811

<110> THE GOVERNMENT OF THE UNITED STATES OF AMERICA AS
 REPRESENTED BY THE SECRETARY OF THE DEPARTMENT OF HEALTH AND
 HUMAN SERVICES
 Valenzuela, Jesus G.
 Ribeiro, Jose M.C.
 Barral, Aldina
 Netto, Manoel
 Brodskyn, Claudia
 Gomes, Regis

<120> LUTZOMYIA LONGIPALPIS POLYPEPTIDES AND METHODS OF USE

<130> 4239-67028

<150> US 60/422,303

<151> 2002-10-29

<160> 73

<170> PatentIn version 3.2

<210> 1

<211> 271

<212> PRT

<213> Lutzomyia longipalpis

<400> 1

Met Leu Gln Ile Lys His Leu Leu Ile Phe Val Gly Leu Leu Val Val
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Val Asn Ala Gln Ser Asn Tyr Cys Lys Gln Glu Ser Cys Ser Ser Gly
 20 25 30

Gly Val Glu Arg Pro His Ile Gly Cys Lys Asn Ser Gly Asp Phe Ser
 35 40 45

Glu Thr Cys Ser Gly Asp Ala Glu Ile Val Lys Met Asp Lys Lys Lys
 50 55 60

Gln Asn Leu Leu Val Lys Met His Asn Arg Leu Arg Asp Arg Phe Ala
 65 70 75 80

Arg Gly Ala Val Pro Gly Phe Ala Pro Ala Ala Lys Met Pro Met Leu
 85 90 95

Lys Trp Asn Asp Glu Leu Ala Lys Leu Ala Glu Tyr Asn Val Arg Thr
 100 105 110

Cys Lys Phe Ala His Asp Lys Cys Arg Ala Ile Asp Val Cys Pro Tyr
 115 120 125

Ala Gly Gln Asn Leu Ala Gln Met Met Ser Tyr Pro Thr His Arg Asp
130 135 140

Leu Asn Tyr Val Leu Lys Asn Leu Thr Arg Glu Trp Phe Trp Glu Tyr
145 150 155 160

Arg Trp Ala Lys Gln Ser Gln Leu Asp Asn Tyr Val Gly Gly Pro Gly
165 170 175

Lys Asp Asn Lys Gln Ile Gly His Phe Thr Ala Phe Val His Glu Lys
180 185 190

Thr Asp Lys Val Gly Cys Ala Ile Ala Arg Phe Thr Asn Glu His Asn
195 200 205

Phe Lys Glu Thr Leu Leu Ala Cys Asn Tyr Cys Tyr Thr Asn Met Met
210 215 220

Lys Glu Arg Ile Tyr Thr Gln Gly Lys Pro Cys Ser Gln Cys Gln Ser
225 230 235 240

Lys Lys Cys Gly Pro Val Tyr Lys Asn Leu Cys Asp Pro Ser Glu Lys
245 250 255

Val Asp Pro Thr Pro Asp Val Leu Lys Gln Trp Lys His Gly Lys
260 265 270

<210> 2

<211> 905

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 2

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cgggaggtgt tgagagaccc catattgggt gcaaaaactc tggagatttt tccgaaactt	180
gctccggaga tgcagaaatt gttaagatgg acaagaagaa gcagaacctc cttgtgaaaa	240
tgcacaatcg cctgagagat agatttgctc gtggtgcagt gccaggtttt gcaccagctg	300
cgaaaatgcc aatgcttaaa tggaacgatg aactggccaa attggcagag tacaacgtga	360
gaacgtgcaa atttgccac gataaatgcc gcgcaattga tgtctgcccc tatgtggac	420
agaatctagc tcaaatgatg tcctatccta cccatcgaga tctaaactat gttcttaaga	480
atctcacaag ggaatgggtc tgggagtaca gatgggctaa gcaatctcag cttgataatt	540

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acgtgggtgg tcctgggaaa gacaacaaac aaattggaca tttcacagct tttgtgcatg      600
agaaaacaga caaagttgga tgcgctatag ctcgatttac aaatgagcac aattttaagg      660
agaccctcct agcttgcaac tactgctaca cgaatatgat gaaggagagg atctacacgc      720
agggaaaacc ttgttcacag tgtcagagca aaaagtgtgg gccagtctac aagaacctgt      780
gtgatccttc ggagaagggt gatccaactc ctgatgtcct taagcaatgg aagcatggaa      840
aatgattatt aagctcactt caaatgtttc caatccaaaa aaaaaaaaaa aaaaaaaaaa      900
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<210> 3
<211> 159
<212> PRT
<213> Lutzomyia longipalpis

<400> 3

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Met Leu Leu Arg Ser Leu Phe Val Leu Phe Leu Ile Phe Leu Thr Phe
1           5           10           15

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Cys Asn Ala Glu Glu Leu Ile Glu Arg Lys Leu Thr Gly Lys Thr
          20           25           30

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Ile Tyr Ile Ser Thr Ile Lys Leu Pro Trp Phe Gln Ala Leu Asn His
          35           40           45

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Cys Val Lys Asn Gly Tyr Thr Met Val Ser Ile Lys Thr Phe Glu Glu
          50           55           60

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Asn Lys Glu Leu Leu Lys Glu Leu Lys Arg Val Ile Arg Thr Glu Asp
65           70           75           80

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Thr Gln Val Trp Ile Gly Gly Leu Lys His His Gln Phe Ala Asn Phe
          85           90           95

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Arg Trp Val Ser Asp Gly Ser His Val Ala Thr Ala Ser Gly Tyr Thr
          100          105          110

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Asn Trp Ala Pro Gly Glu Pro Ala Asp Ser Phe Tyr Tyr Asp Gln Phe
          115          120          125

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Cys Met Ala Met Leu Phe Arg Lys Asp Gly Ala Pro Trp Asp Asp Leu
          130          135          140

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Asn Cys Trp Val Lys Asn Leu Phe Val Cys Glu Lys Arg Asp Asp
          145          150          155

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<210> 4
 <211> 617
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 4
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 acttattgag agaaagttaa caggaaaaac gatctatatc tcaacaataa agcttccgtg 180
 gttccaagct cttaatcatt gtgttaaaaaa tggctacaca atggtgtcaa ttaagacatt 240
 tgaagagaat aaagaactcc ttaaagaact caaaaggggtg attaggacag aagatacaca 300
 agtttggatt ggaggcctca aacatcatca atttgcaaac tttcgttggg taagcgatgg 360
 aagccacgta gcaacagctt cagggtacac caattgggcc ccagggggagc cagctgattc 420
 cttctattac gatcaatttt gcatggcgat gttgttcaga aaagacggcg ctccgtggga 480
 tgatttgaat tgttgggtta agaatctttt tgtttgtgag aaacgagatg attgagaggc 540
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 <211> 304
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 5

Met Lys Leu Leu Gln Ile Ile Phe Ser Leu Phe Leu Val Phe Phe Pro
 1 5 10 15

Thr Ser Asn Gly Ala Leu Thr Gly Asn Glu Ser Ala Ala Asn Ala Ala
 20 25 30

Pro Leu Pro Val Val Leu Trp His Gly Met Gly Asp Ser Cys Cys Phe
 35 40 45

Pro Phe Ser Leu Gly Ser Ile Lys Lys Leu Ile Glu Gln Gln Ile Pro
 50 55 60

Gly Ile His Val Val Ser Leu Lys Ile Gly Lys Ser Leu Ile Glu Asp
 65 70 75 80

Tyr Glu Ser Gly Phe Phe Val His Pro Asp Lys Gln Ile Gln Glu Val
 85 90 95

Cys Glu Ser Leu Gln Asn Asp Leu Thr Leu Ala Asn Gly Phe Asn Ala
 100 105 110

Ile Gly Phe Ser Gln Gly Ser Gln Phe Leu Arg Gly Leu Val Gln Arg
 115 120 125

Cys Ser Ser Ile Gln Val Arg Asn Leu Ile Ser Ile Gly Gly Gln His
 130 135 140

Gln Gly Val Phe Gly Leu Pro Tyr Cys Pro Ser Leu Ser Arg Lys Thr
 145 150 155 160

Cys Glu Tyr Phe Arg Lys Leu Leu Asn Tyr Ala Ala Tyr Glu Lys Trp
 165 170 175

Val Gln Lys Leu Leu Val Gln Ala Thr Tyr Trp His Asp Pro Leu Asn
 180 185 190

Glu Asp Ala Tyr Arg Thr Gly Ser Thr Phe Leu Ala Asp Ile Asn Asn
 195 200 205

Glu Arg Gln Ile Asn Asn Asp Tyr Ile Asn Asn Ile Arg Lys Leu Asn
 210 215 220

Arg Phe Val Met Val Lys Phe Leu Asn Asp Ser Met Val Gln Pro Ile
 225 230 235 240

Glu Ser Ser Phe Phe Gly Phe Tyr Ala Pro Gly Thr Asp Thr Glu Val
 245 250 255

Leu Pro Leu Lys Gln Ser Lys Ile Tyr Leu Glu Asp Arg Leu Gly Leu
 260 265 270

Gln Ser Val Pro Ile Asp Tyr Leu Glu Cys Gly Gly Asp His Leu Gln
 275 280 285

Phe Thr Lys Glu Trp Phe Ile Lys Phe Ile Ile Pro Tyr Leu Lys Gln
 290 295 300

<210> 6

<211> 1273

<212> DNA

<213> Lutzomyia longipalpis

<400> 6

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ttaacaaaat tgctccattt tttcgttttc tgaatattct gttgaaattt tgattaatct 120

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attttatgtg cagtttttac taaaaatccc ttatcagcaa cccggtgtct acagttttgt      180
cacgctcagt agcatcttca aggtggtaag aaaaaatgaa actcctgcaa atcatcttct      240
ctctcttcct ggtctttttc ccgacctcaa atggggccct gaccggaaat gaaagtgcag      300
caaatgcagc tcccttgcct gtcgtcctgt ggcacgggat gggcgattct tgctgctttc      360
ccttcagttt gggaagcata aaaaaattaa ttgaacaaca aattcctggg attcatgttg      420
ttagcctgaa aattggaaag tctctcattg aggactatga aagtggattt tttgttcac      480
cagacaagca aattcaggaa gtttgtgagt cacttcagaa cgatctaaca ctcgcaaattg      540
gattcaatgc aattggattt tctcagggtg gtcagttcct gcgaggtctt gtgcaacgat      600
gttctttctat acaagtaagg aatctcattt ccattggagg acagcatcaa ggggtttttg      660
gtctgcccta ttgtccttcg ttgagcagaa agacttgca atactttaga aagctcctga      720
attatgcagc ttatgaaaaa tgggtacaga aactcctagt tcaagccacc tactggcatg      780
atcctctaaa tgaggatgca tatcggactg gaagcacttt ccttgctgat ataaataatg      840
agagacaaat caataatgac tatattaata atattcgga gctaaatcgt tttgtgatgg      900
taaagttcct caacgacagc atgggtcagc caattgaatc tagttttctt ggattctacg      960
ctccaggaac tgatacagaa gttctcccat taaaacaaag caagatttat ttggaagatc     1020
gtttgggact tcaatcagta ccgatagatt atctagaatg cggaggagat catttgcaat     1080
ttacaaaaga atggttcata aagtttatca taccctatct gaagcaataa gagctgcaat     1140
gtaattgatt aaaaaatggt aaccatttca ggatgattgg gtgaccctt aaaaatataa     1200
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aaaaaaaaaa aaa                                                                1273

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<210> 7
<211> 102
<212> PRT
<213> Lutzomyia longipalpis

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<400> 7

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Met Arg Asn Phe Ala Val Val Ser Leu Ala Val Ala Val Leu Leu Phe
1           5           10           15

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Cys Ala Trp Pro Ile Asn Ala Glu Asp Asn Glu Glu Val Gly Lys Ala
20           25           30

```

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Arg Glu Lys Arg Gly Leu Lys Asp Ala Met Glu His Phe Lys Asn Gly
35           40           45

```

Phe Lys Glu Leu Thr Lys Asp Phe Lys Leu Pro Ser Leu Pro Ser Leu
 50 55 60

Pro Gly Phe Gly Lys Lys Pro Glu Ser Gly Ser Ser Glu Asp Ser Gly
 65 70 75 80

Asp Lys Thr Glu Asp Thr Ser Gly Ser Lys Asp Asp Gln Ser Lys Asp
 85 90 95

Asn Thr Val Glu Glu Ser
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<210> 8
 <211> 466
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 8
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 ataatgaaga agttggaaag gcgagagaaa aaagaggctt aaaagacgca atggaacact 180
 tcaaaaatgg atttaaggag ctgacaaagg actttaaact tccaagcctt ccaagtcttc 240
 ctggattttg taaaaagcct gaatctggaa gttctgaaga ttctggagat aaaactgagg 300
 ataccagtgg atctaaggac gaccaatcaa aggataatac ggtcgaagaa tcttaagaaa 360
 ggcgcaaata gctatatttc aagtggcgaa tgtttctttc tttatctgaa ataaatattt 420
 ttaaaccctt cgaaaccaa aaaaaaaaaa aaaaaaaaaa aaaaaa 466

<210> 9
 <211> 247
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 9

Met Asn Phe Leu Leu Lys Ile Phe Ser Leu Leu Cys Leu Cys Gly Leu
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Gly Tyr Ser Trp Gln Asp Val Arg Asn Ala Asp Gln Thr Leu Trp Ala
 20 25 30

Tyr Arg Ser Cys Gln Lys Asn Pro Glu Asp Lys Asp His Val Pro Gln
 35 40 45

Trp Arg Lys Phe Glu Leu Pro Asp Asp Glu Lys Thr His Cys Tyr Val
 50 55 60

Lys Cys Val Trp Thr Arg Leu Gly Ala Tyr Asn Glu Asn Glu Asn Val
65 70 75 80

Phe Lys Ile Asp Val Ile Thr Lys Gln Phe Asn Glu Arg Gly Leu Glu
85 90 95

Val Pro Ala Gly Leu Asp Gln Glu Leu Gly Gly Ser Thr Asp Gly Thr
100 105 110

Cys Lys Ala Val Tyr Asp Lys Ser Met Lys Phe Phe Lys Ser His Phe
115 120 125

Met Asp Phe Arg Asn Ala Tyr Tyr Ala Thr Tyr Asp Gly Ser Asp Glu
130 135 140

Trp Phe Ser Lys Asn Pro Asp Val Lys Pro Lys Gly Thr Lys Val Ser
145 150 155 160

Glu Tyr Cys Lys Asn Lys Asp Asp Gly Asp Cys Lys His Ser Cys Ser
165 170 175

Met Tyr Tyr Tyr Arg Leu Ile Asp Glu Asp Asn Leu Val Ile Pro Phe
180 185 190

Ser Asn Leu Pro Asp Tyr Pro Glu Asp Lys Leu Glu Glu Cys Arg Asn
195 200 205

Glu Ala Lys Ser Ala Asn Glu Cys Lys Ser Ser Val Ile Tyr Gln Cys
210 215 220

Leu Glu Asn Ala Asp Lys Ser Ala Leu Asp Ala Ser Leu Asn Ile Leu
225 230 235 240

Asp Glu Phe Ser Gly Arg Tyr
245

<210> 10

<211> 955

<212> DNA

<213> Lutzomyia longipalpis

<400> 10

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gtatagatcg tgccaaaaga atcctgaaga taaggatcac gtacctcaat ggaggaagtt 180

cgaattaccc gacgatgaaa agactcattg ctacgtcaag tgcgtatgga cgcgtttggg 240

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agcttacaat gaaaatgaaa atgttttcaa aattgatgtc attactaagc aatttaatga      300
acgtggccta gaagttccgg ctggacttga tcaagaattg ggtgggttcta cagatggaac      360
ttgcaaagca gtttacgata aatccatgaa gttcttcaaa tctcatttta tggacttttag      420
gaatgcttac tacgcaactt atgacgggtc tgatgaatgg tttagcaaga accctgatgt      480
aaaaccgaaa ggaacaaaag tttccgaata ctgcaaaaat aaagatgatg gagattgcaa      540
acattcctgc agtatgtact actaccgctt aatcgatgaa gacaacttag ttattccggt      600
cagcaactta cctgactatc ccgaagataa gctcgaggaa tgcaggaatg aagccaagtc      660
cgcaaatgag tgcaaatcat ctgttatcta tcagtgtttg gaaaatgcgg ataagtcagc      720
tttagacgcg tctttgaata tactcgatga gttttctgga agatattaaa acaaactgga      780
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tttaacctat tgtcccacta ggaagaaaaa tccatatttg gtgatgttaa actatttttg      900
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<210> 11
<211> 325
<212> PRT
<213> Lutzomyia longipalpis

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<400> 11

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1           5           10           15

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Gly Val Ser Gln Ala Ala Pro Pro Gly Val Glu Trp Tyr His Phe Gly
          20           25           30

```

```

Leu Ile Ala Asp Met Asp Lys Lys Ser Ile Ala Ser Asp Lys Thr Thr
          35           40           45

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Phe Asn Ser Val Leu Lys Ile Asp Glu Leu Arg His Asn Thr Lys Thr
          50           55           60

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Asp Gln Tyr Ile Tyr Val Arg Ser Arg Val Lys Lys Pro Val Ser Thr
65           70           75           80

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Arg Tyr Gly Phe Lys Gly Arg Gly Ala Glu Leu Ser Glu Ile Val Val
          85           90           95

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```

Phe Asn Asn Lys Leu Tyr Thr Val Asp Asp Lys Ser Gly Ile Thr Phe
          100          105          110

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Arg Ile Thr Lys Asp Gly Lys Leu Phe Pro Trp Val Ile Leu Ala Asp
 115 120 125

Ala Asp Gly Gln Arg Pro Asp Gly Phe Lys Gly Glu Trp Ala Thr Ile
 130 135 140

Lys Asp Asp Thr Ile Tyr Val Gly Ser Thr Gly Met Leu Lys Phe Thr
 145 150 155 160

Ser Ser Leu Trp Val Lys Lys Ile Thr Lys Asp Gly Val Val Thr Ser
 165 170 175

His Asp Trp Thr Asp Lys Tyr Arg Lys Ile Leu Lys Ala Leu Asn Met
 180 185 190

Pro Asn Gly Phe Val Trp His Glu Ala Val Thr Trp Ser Pro Phe Arg
 195 200 205

Lys Gln Trp Val Phe Met Pro Arg Lys Cys Ser Arg His Pro Phe Ser
 210 215 220

Gln Glu Leu Glu Glu Arg Thr Gly Cys Asn Lys Ile Val Thr Ala Asp
 225 230 235 240

Glu Asn Phe Asn Asp Ile Gln Val Ile His Ile Gln Asp Gln Pro Tyr
 245 250 255

Asn Leu Ala Ser Gly Phe Ser Ser Phe Arg Phe Ile Pro Gly Thr Lys
 260 265 270

Asn Glu Arg Leu Leu Ala Leu Arg Thr Val Glu Gln Glu Asp Gln Val
 275 280 285

Lys Thr Trp Ala Val Val Met Asp Met Lys Gly Thr Val Leu Met Tyr
 290 295 300

Glu Lys Glu Leu Tyr Asp Glu Lys Phe Glu Gly Leu Ala Phe Phe Gly
 305 310 315 320

Gly Ile Lys Lys Asn
 325

<210> 12

<211> 1071

<212> DNA

<213> Lutzomyia longipalpis

<400> 12
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ctgatatgga caaaaaatcc atcgcgagtg acaaaaccac ctttaacagc gtcctaaaga 180
tcgatgaatt gcgccacaac acaaaaacgg atcaatacat ttatgtgctg agtcgagtga 240
agaagcccgt ttccacgagg tatgggttca aaggacgcgg tgcggaattg tcggaaattg 300
ttgtcttcaa caataaactt tacacagttg atgataaatc tgggaattacg ttccgcataa 360
cgaaagacgg aaaactcttc ccgtgggtta ttctcgcaga tgccgatgga cagcgacccg 420
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cgagtcacga ttggactgat aaataccgaa agattctcaa agctctaaac atgccaaatg 600
gttttgtctg gcatgaggct gttacgtggg ctccattcag gaagcaatgg gtcttcatgc 660
cgagaaagtg ctcaaggcat cccttctcac aggaactcga agaacgcaca gggtgcaata 720
aaatagtgac ggcagatgag aatttcaacg acattcaagt tattcacatt caagatcagc 780
catataatth agcttctggg ttctcttcct tccgctttat tcctggtacg aaaaatgaaa 840
gacttctcgc cttgaggaca gtagagcagg aagatcagggt taaaacttgg gctgtgggtca 900
tggatatgaa aggaacagtt ctgatgtacg aaaaggaact ttatgacgaa aaattcgaag 960
gttttagcatt ctttgggtgg attaaaaaga attaatgtgt tccagaagct tttagatgaa 1020
ataataaatt ttatttcatt ttaaaaaaaaa aaaaaaaaaa aaaaaaaaaa a 1071

<210> 13
<211> 160
<212> PRT
<213> *Lutzomyia longipalpis*

<400> 13
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1 5 10 15
Ser Thr Ala Leu Gln Val Thr Glu Lys Glu Leu Ser Asp Gly Lys Lys
20 25 30
Ile Phe Ile Ser Lys Val Glu Leu Asn Trp Phe Glu Ala Leu Asp Phe
35 40 45
Cys Ile His Arg Gly Leu Thr Leu Leu Ser Ile Lys Ser Ala Lys Glu
50 55 60

Asn Val Asp Val Thr Lys Ala Ile Arg Ala Glu Leu Asn Phe Asp Ser
65 70 75 80

Lys Lys Leu Ala His Val Trp Thr Gly Gly Ile Arg His Ser Gln Asp
85 90 95

Lys Tyr Phe Arg Trp Ile Asn Asp Gly Thr Lys Val Val Lys Arg Val
100 105 110

Tyr Thr Asn Trp Phe Thr Gly Glu Pro Asn Asn Gly Tyr Trp Lys Asp
115 120 125

Glu Phe Cys Leu Glu Ile Tyr Tyr Lys Thr Glu Glu Gly Lys Trp Asn
130 135 140

Asp Asp Lys Cys His Val Lys His His Phe Val Cys Gln Glu Lys Lys
145 150 155 160

<210> 14
<211> 648
<212> DNA
<213> Lutzomyia longipalpis

<400> 14
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ttctcaagaa gaaaatattc aaaagtaaag aatggcggtg aagtttcttc cggttctcct 120
tctaagctgc ttcgcaatga gcacggcact acaagttact gagaaggaac tttctgatgg 180
gaaaaagatc ttcattctcca aagttgagct aaactgggtc gaagctcttg atttctgtat 240
ccatcgtggg cttacgttgc tctcaattaa atccgccaag gaaaatgtag acgtaacaaa 300
agcaattcgg gctgaattga attttgattc aaagaaattg gctcatgtgt ggactggagg 360
tattcgccat agtcaagata agtatttccg ttggataaat gatggaacta aagttgttaa 420
acgagtctac accaattggg tctactggaga accaaataat ggttactgga aggatgaatt 480
ttgtctggaa atttactata aaaccgaaga aggggaagtgg aatgatgata aatgtcacgt 540
gaagcatcat tttgtatgtc aagaaaagaa ataaattgat tgattttgtt tgctgatttg 600
cagttcagaa ttgaaaagcc aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 648

<210> 15
<211> 301
<212> PRT
<213> Lutzomyia longipalpis
<400> 15

Met Asn Ser Ile Asn Phe Leu Ser Ile Val Gly Leu Ile Ser Phe Gly
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Phe Ile Val Ala Val Lys Cys Asp Gly Asp Glu Tyr Phe Ile Gly Lys
 20 25 30

Tyr Lys Glu Lys Asp Glu Thr Leu Phe Phe Ala Ser Tyr Gly Leu Lys
 35 40 45

Arg Asp Pro Cys Gln Ile Val Leu Gly Tyr Lys Cys Ser Asn Asn Gln
 50 55 60

Thr His Phe Val Leu Asn Phe Lys Thr Asn Lys Lys Ser Cys Ile Ser
 65 70 75 80

Ala Ile Lys Leu Thr Ser Tyr Pro Lys Ile Asn Gln Asn Ser Asp Leu
 85 90 95

Thr Lys Asn Leu Tyr Cys Gln Thr Gly Gly Ile Gly Thr Asp Asn Cys
 100 105 110

Lys Leu Val Phe Lys Lys Arg Lys Arg Gln Ile Ala Ala Asn Ile Glu
 115 120 125

Ile Tyr Gly Ile Pro Ala Lys Lys Cys Ser Phe Lys Asp Arg Tyr Ile
 130 135 140

Gly Ala Asp Pro Leu His Val Asp Ser Tyr Gly Leu Pro Tyr Gln Phe
 145 150 155 160

Asp Gln Glu His Gly Trp Asn Val Glu Arg Tyr Asn Ile Phe Lys Asp
 165 170 175

Thr Arg Phe Ser Thr Glu Val Phe Tyr His Lys Asn Gly Leu Phe Asn
 180 185 190

Thr Gln Ile Thr Tyr Leu Ala Glu Glu Asp Ser Phe Ser Glu Ala Arg
 195 200 205

Glu Ile Thr Ala Lys Asp Ile Lys Lys Lys Phe Ser Ile Ile Leu Pro
 210 215 220

Asn Glu Glu Tyr Lys Arg Ile Ser Phe Leu Asp Val Tyr Trp Phe Gln
 225 230 235 240

Glu Thr Met Arg Lys Lys Pro Lys Tyr Pro Tyr Ile His Tyr Asn Gly
 245 250 255

Glu Cys Ser Asn Glu Asn Lys Thr Cys Glu Leu Val Phe Asp Thr Asp
 260 265 270

Glu Leu Met Thr Tyr Ala Leu Val Lys Val Phe Thr Asn Pro Glu Ser
 275 280 285

Asp Gly Ser Arg Leu Lys Glu Glu Asp Leu Gly Arg Gly
 290 295 300

<210> 16
 <211> 1021
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 16
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 gatgaatatt tcattggaaa atacaaagaa aaagatgaga cactgttttt tgcaagctac 180
 ggccataaaga gggatccttg ccaaattgtc ttaggctaca aatgctcaaa caatcaaacc 240
 cactttgtgc ttaattttta aaccaataag aaatcctgca tatcagcaat taagctgact 300
 tcttacccaa aaatcaatca aaactcggat ttaactaaaa atctctactg ccaaactgga 360
 ggaataggaa cagataactg caaactgtgc ttcaagaaac gtaaaagaca aatagcagct 420
 aatattgaaa tctacggcat tccagcgaag aaatgttcct tcaaggatcg ttacattgga 480
 gctgatccac tccacgtcga ttcctatggg cttccgtatc agtttgatca ggaacatgga 540
 tggaatgtgg aacgatataa cattttcaaa gacacaagat tttccacaga agttttctac 600
 cacaaaaatg gtttatttta caccctaaata acttatttgg ctgaagaaga ttccttctct 660
 gaagctcgag agattactgc gaaggatatt aagaagaagt tttcaattat tttgcccaat 720
 gaagagtata agaggattag tttcttggac gtttattggt tccaggagac tatgcgaaaa 780
 aagcctaaat atccctacat tcaactaat ggagaatgca gcaatgagaa taaaacttgt 840
 gaacttgtct ttgacaccga tgaactaatg acctacgcc ttgttaaagt ctttactaat 900
 cctgagagtg atggatctag gctcaaagaa gaggatttgg gaagaggata aatcttctta 960
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 a 1021

<210> 17
 <211> 161
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 17

Met Ala Phe Ser Asn Thr Leu Phe Val Leu Phe Val Ser Phe Leu Thr
 1 5 10 15

Phe Cys Gly Ala Asp Gln Thr Leu Ile Glu Lys Glu Leu Thr Gly Arg
 20 25 30

Thr Val Tyr Ile Ser Lys Ile Lys Leu Asn Trp Asn Asp Ala Phe Asp
 35 40 45

Tyr Cys Ile Arg Asn Gly Leu Thr Phe Ala Lys Ile Lys Ser Ala Glu
 50 55 60

Glu Asn Thr Glu Leu Ser Glu Lys Leu Lys Thr Val Ile Arg Thr Glu
 65 70 75 80

Glu Phe Gln Val Trp Ile Gly Gly Ile Glu His His Gln Asp Ser Ser
 85 90 95

Phe Arg Trp Val Ser Asp Ser Gln Pro Ile Thr Asn Lys Leu Gly Tyr
 100 105 110

115

120

125

Glu Tyr Cys Leu Glu Ile Leu Phe Arg Lys Glu Asp Gly Lys Trp Asn
 130 135 140

Asp Phe Pro Cys Ser Ala Arg His His Phe Val Cys Glu Lys Arg Thr
 145 150 155 160

Lys

<210> 18

<211> 586

<212> DNA

<213> Lutzomyia longipalpis

<400> 18

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 actgtttata tctccaaaat taagctaaat tggaacgatg ccttcgatta ctgcatccgc 180
 aatggcctca cctttgctaa gattaaatca gctgaagaaa acaccgaact gagtgagaaa 240
 ctcaagacag tcattcgtac ggaggagttt caagtttgga ttggaggcat tgaacatcat 300
 caagacagtt ccttccgctg ggtaagcgac tcccaaccaa taaccaacaa attgggctac 360

aaatacacia actggaatac cggagagccc acaaattacc aaaacaacga atattgcttg 420
 gaaatattat tccggaagga agatggaaaa tggaatgatt ttccctgcag tgcaagacat 480
 cattttgttt gtgaaaaaag aacaaaataa aatgaagaaa atgtgatttt cctttgggtg 540
 aagaataaaa ttctgttgaa aaaaaaaaaa aaaaaaaaaa aaaaaa 586

<210> 19
 <211> 105
 <212> PRT
 <213> Lutzomyia longipalpis

<400> 19

Met Gln Asn Phe Leu Leu Val Ser Leu Ala Leu Ala Ala Leu Met Leu
 1 5 10 15

Cys Ala Glu Ala Lys Pro Tyr Asp Phe Pro Leu Tyr Gln Asp Leu Ile
 20 25 30

Gln Gly Val Ile Gln Arg Glu Ser Gln Ala Glu Arg Glu Lys Arg Ser
 35 40 45

Pro Asn Glu Asp Tyr Glu Lys Gln Phe Gly Asp Ile Val Asp Gln Ile
 50 55 60

Lys Glu Ile Ser Phe Asn Val Met Lys Met Pro His Phe Gly Ser Ser
 65 70 75 80

Asp Asp Asn Arg Asp Asp Gly Glu Tyr Val Asp His His Tyr Gly Asp
 85 90 95

Glu Asp Asp Arg Asp Tyr Asp His Tyr
 100 105

<210> 20
 <211> 457
 <212> DNA
 <213> Lutzomyia longipalpis

<400> 20

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 attcagggcg ttattcagcg cgaaagtcaa gctgagaggg agaagagaag cccaatgag 180
 gactatgaga agcaatttgg ggatattgtt gatcaaatta aggaaattag tttcaatgtc 240
 atgaaaatgc cccattttgg aagctctgat gataatcgtg atgatggcga gtacgttgat 300

catcattatg gtgacgaaga tgatcgtgat tatgatcatt actaaatact acttgctcct 360
 gctgaatgac ttgaaggaat cttttttttg caaaaatatc catcaaatta ttgaattaat 420
 aaagttgcaa aaaaaaaaaa aaaaaaaaaa aaaaaaa 457

<210> 21
 <211> 157
 <212> PRT
 <213> Lutzomyia longipalpis

<400> 21

Met Lys Phe Tyr Ile Phe Gly Val Phe Leu Val Ser Phe Leu Ala Leu
 1 5 10 15

Cys Asn Ala Glu Asp Tyr Asp Lys Val Lys Leu Thr Gly Arg Thr Val
 20 25 30

Tyr Ile Ser Arg Ser Lys Ala Pro Trp Phe Thr Ala Leu Asp Asn Cys
 35 40 45

Asn Arg Arg Phe Thr Phe Ala Met Ile Lys Ser Gln Lys Glu Asn Glu
 50 55 60

Glu Leu Thr Asn Ala Leu Leu Ser Val Ile Lys Ser Asp Glu Glu Asn
 65 70 75 80

Val Trp Ile Gly Gly Leu Arg His Asp Leu Asp Asp Tyr Phe Arg Trp
 85 90 95

Ile Ser Phe Gly Thr Ala Leu Ser Lys Thr Ser Tyr Thr Asn Trp Ala
 100 105 110

Pro Lys Glu Pro Thr Gly Arg Pro His Arg Thr Gln Asn Asp Glu Phe
 115 120 125

130

135

140

Cys Trp Arg Lys Arg Leu Tyr Val Cys Glu Lys Arg Asp
 145 150 155

<210> 22
 <211> 596
 <212> DNA
 <213> Lutzomyia longipalpis

<400> 22

gtttaaggaa tttctttcat ctcagtcttc gattttcttt aaacaaataa tgaagtttta 60

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agtaaaactt actggaagaa ctgtttacat ctccagatca aaggctccgt ggttcacagc    180
tttagacaat tgtaatcggt tacgcttcac cttcgccatg atcaagtctc agaaggagaa    240
tgaagagcta acaaatgcgc ttttaagtgt aattaaatct gacgaagaaa atgtttggat    300
tggaggtctt aggcacgacg tggatgacta cttccgttgg attagttttg gaactgcatt    360
gtcaaagact tcgtacacca attgggcccc aaaggaaccc acaggaaggc cccatagaac    420
tcaaaatgat gaattctgca tgcaaagtgc tttcaaagat ggtggcaa at ggagtgataa    480
cacctgttgg cgtaaactgt tgtacgtttg tgaaaagcgt gattaaataa aggaacactg    540
ccaatgaata ttgggcaatt tgagagaaat taaattaa aa aaaaaaaaaa aaaaaa    596

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<210> 23
<211> 412
<212> PRT
<213> Lutzomyia longipalpis

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<400> 23

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Met Arg Phe Phe Phe Val Phe Leu Ala Ile Val Leu Phe Gln Gly Ile
1           5           10           15

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His Gly Ala Tyr Val Glu Ile Gly Tyr Ser Leu Arg Asn Ile Thr Phe
          20           25           30

```

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Asp Gly Leu Asp Thr Asp Asp Tyr Asn Pro Lys Phe Asn Ile Pro Thr
      35           40           45

```

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Gly Leu Ala Val Asp Pro Glu Gly Tyr Arg Leu Phe Ile Ala Ile Pro
      50           55           60

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Arg Arg Lys Pro Lys Val Pro Tyr Thr Val Ala Glu Leu Asn Met Val
65           70           75           80

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Met Asn Pro Gly Phe Pro Val Glu Arg Ala Pro Ser Phe Glu Lys Phe
          85           90           95

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Lys Lys Phe Asn Gly Glu Gly Lys Lys Asp Leu Val Asn Val Tyr Gln
      100           105           110

```

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Pro Val Ile Asp Asp Cys Arg Arg Leu Trp Val Leu Asp Ile Gly Lys
      115           120           125

```

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Val Glu Tyr Thr Gly Gly Asp Ala Asp Gln Tyr Pro Lys Gly Lys Pro
      130           135           140

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Thr Leu Ile Ala Tyr Asp Leu Lys Lys Asp His Thr Pro Glu Ile His
 145 150 155 160
 Arg Phe Glu Ile Pro Asp Asp Leu Tyr Ser Ser Gln Val Glu Phe Gly
 165 170 175
 Gly Phe Ala Val Asp Val Val Asn Thr Lys Gly Asp Cys Thr Glu Ser
 180 185 190
 Phe Val Tyr Leu Thr Asn Phe Lys Asp Asn Ser Leu Ile Val Tyr Asp
 195 200 205
 Glu Thr Gln Lys Lys Ala Trp Lys Phe Thr Asp Lys Thr Phe Glu Ala
 210 215 220
 225 230 235 240
 Lys Val Gly Leu Phe Gly Ile Ala Leu Gly Asp Arg Asp Glu Met Gly
 245 250 255
 His Arg Pro Ala Cys Tyr Ile Ala Gly Ser Ser Thr Lys Val Tyr Ser
 260 265 270
 Val Asn Thr Lys Glu Leu Lys Thr Glu Asn Gly Gln Leu Asn Pro Gln
 275 280 285
 Leu His Gly Asp Arg Gly Lys Tyr Thr Asp Ala Ile Ala Leu Ala Tyr
 290 295 300
 Asp Pro Glu His Lys Val Leu Tyr Phe Ala Glu Ser Asp Ser Arg Gln
 305 310 315 320
 Val Ser Cys Trp Asn Val Asn Met Glu Leu Lys Pro Asp Asn Thr Asp
 325 330 335
 Val Ile Phe Ser Ser Ala Arg Phe Thr Phe Gly Thr Asp Ile Leu Val
 340 345 350
 Asp Ser Lys Gly Met Leu Trp Ile Met Ala Asn Gly His Pro Pro Val
 355 360 365
 Glu Asp Gln Glu Lys Ile Trp Lys Met Arg Phe Val Asn Arg Lys Ile
 370 375 380
 Arg Ile Met Lys Val Asp Thr Glu Arg Val Phe Lys Tyr Ser Arg Cys

385

390

395

400

Asn Pro Asn Tyr Lys Pro Pro Lys Glu Ile Glu Val
 405 410

<210> 24

<211> 1409

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 24

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attcgatgga ttggatacag atgactacaa tccaaagtcc aacattccaa cgggtttggc      180
agttgatccc gaaggatata ggctcttcat agccatccca aggagaaagc caaagggttcc      240
ctacactgtg gctgaactga atatgggtcat gaatcccga tttcccgctc agagagctcc      300
gagctttgag aaattcaaaa aattcaatgg cgagggcaaa aaggatcttg ttaatgtgta      360
tcagccagtc attgatgatt gtcgctgtct ttgggtgctt gacattggga aggtggaata      420
caccggtggt gatgctgac aatatcccaa aggaaagcct accctaattg cctacgacct      480
caagaaggat cactactcgg aaattcatcg atttgaaatt ccagacgac tctatagctc      540
acaagttgaa tttggtggat ttgccgttga tggtgttaac acgaaaggag actgtacgga      600
gtcatttgtc tacctgacca atttcaagga taactctcta attgtctacg atgagacaca      660
aaagaaagct tggaaattca cagataaaac atttgaagct gataaggaat ccacgttctc      720
ctactcggga gaggaacaaa tgaagtacaa agtcggtctt tttgggtag ctctgggtga      780
tagggatgaa atggggcatc gtccctgcctg ctacatcgct gggagtagca ccaaagtcta      840
cagtgttaac actaaagaac tcaaaacaga gaatggtcag ttaaatactc agcttcacgg      900
tgatcgtgga aagtacacag atgcaattgc cctagcctac gatcctgagc ataaagtcct      960
ctactttgct gaatccgaca gcaggcaggt gtccctgttg aatgtaaata tggagctaaa     1020
accagacaat acggatgtga tcttctctag tgcccgtttt acttttggaa cggatatttt     1080
ggttgatagc aagggaatgc tgtggataat ggctaattga catccaccag tagaggatca     1140
agagaagatt tggaagatga gattcgtaaa ccggaagatc cgtattatga aagtggatac     1200
ggaacgtgtt ttcaaatatt cacgctgcaa tccaaattat aagcccccaa aggaaattga     1260
agtttgagac acaggaaaaa gctcaatttt caacaagaat ttgatcttaa tctgaatacc     1320
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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa                                1409

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<210> 25
 <211> 295
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 25

Met Ile Lys Glu Val Phe Ser Leu Ala Leu Leu Val Ala Leu Ala Gln
 1 5 10 15

Cys Ala Asn Glu Ile Pro Ile Asn Arg Gln Gly Lys Asp Tyr Pro Val
 20 25 30

Pro Ile Ile Asp Pro Asn Lys Ser Ser Ser Asp Asp Tyr Phe Asp Asp
 35 40 45

Arg Phe Tyr Pro Asp Ile Asp Asp Glu Gly Ile Ala Glu Ala Pro Lys
 50 55 60

Asp Asn Arg Gly Lys Ser Arg Gly Gly Gly Ala Ala Gly Ala Arg Glu
 65 70 75 80

Gly Arg Leu Gly Thr Asn Gly Ala Lys Pro Gly Gln Gly Gly Thr Arg
 85 90 95

Pro Gly Gln Gly Gly Thr Arg Pro Gly Gln Gly Gly Thr Arg Pro Gly
 100 105 110

Gln Gly Gly Thr Arg Pro Gly Gln Gly Gly Thr Arg Pro Gly Gln Gly
 115 120 125

Arg Thr Lys Pro Ala Gln Gly Thr Thr Arg Pro Ala Gln Gly Thr Arg
 130 135 140

Asn Pro Gly Ser Val Gly Thr Lys Glu Ala Gln Asp Ala Ser Lys Gln
 145 150 155 160

Gly Gln Gly Lys Arg Arg Pro Gly Gln Val Gly Gly Lys Arg Pro Gly
 165 170 175

Gln Ala Asn Ala Pro Asn Ala Gly Thr Arg Lys Gln Gln Lys Gly Ser
 180 185 190

Arg Gly Val Gly Arg Pro Asp Leu Ser Arg Tyr Lys Asp Ala Pro Ala
 195 200 205

Lys Phe Val Phe Lys Ser Pro Asp Phe Ser Gly Glu Gly Lys Thr Pro

210	215	220
Thr Val Asn Tyr Phe Arg Thr Lys Lys Lys Glu His Ile Val Thr Arg		
225	230	235 240
Gly Ser Pro Asn Asp Glu Phe Val Leu Glu Ile Leu Asp Gly Asp Pro		
	245	250 255
Thr Gly Leu Gly Leu Lys Ser Glu Thr Ile Gly Lys Asp Thr Arg Leu		
	260	265 270
Val Leu Glu Asn Pro Asn Gly Asn Ser Ile Val Ala Arg Val Lys Ile		
	275	280 285
Tyr Lys Asn Gly Tyr Ser Gly		
290	295	

<210> 26
 <211> 989
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 26
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 cagttccgat cattgatcca aataaatcat cttcggatga ttatttcgat gatcgcttct 180
 accctgatat tgatgatgag ggcataagctg aggtccttaa ggataatagg ggaaaatccc 240
 gtgggtgggtg tgcggtggc gcaagagaag gtaggttagg tacgaatggg gctaaaccgg 300
 gtcaggggtg aactagacca ggacaggggtg gaactaggcc aggacagggg ggaactaggc 360
 caggtcaggg tggaactagg ccaggtcagg gtggaactag acctgggcaa ggtagaacta 420
 agcctgctca gggaactact aggccagctc aggggaactag aaatccagga tcggttggtg 480
 cgaaagaagc ccaggatgag tcaaaacaag gtcaaggtaa aagaaggcca gggcaagttg 540
 gtggtaaaag accaggacaa gcaaatgctc ctaatgcagg cactagaaag caacagaaag 600
 gcagtagagg cgttggaagg cctgatctat cgcgctacaa agatgcccct gctaaattcg 660
 ttttcaaact tcccgatctc agtggagaag gcaaaaactcc aactgtaaat tacttttagaa 720
 cgaagaagaa ggagcacatt gtgaccctgt gtagtcctaa tgatgaattt gttctggaga 780
 ttctcgatgg ggatccaact gggcttggac taaagagtga aaccataggc aaagatacgc 840
 gtttagtgct ggagaatcct aatggaaatt ccatcggtgg tcgtgttaag atctacaaga 900
 acgggttattc aggatgaaga agaaatcctt tgatttcccc cccccctct tcctttaaaa 960

ttcaacataa taataaaaaa aaaaaaaaaa

989

<210> 27

<211> 148

<212> PRT

<213> Lutzomyia longipalpis

<400> 27

Met Asn Ser Val Asn Thr Leu Ile Leu Thr Leu Leu Phe Ala Ile Phe
 1 5 10 15

Leu Leu Val Lys Arg Ser Gln Ala Phe Leu Pro Ser Asp Pro Ser Ile
 20 25 30

Cys Val Lys Asn Leu Val Leu Asp Thr Gly Arg Thr Cys Glu Glu Ser
 35 40 45

Glu Tyr Phe Pro Asp Ile Lys Asn Val Lys Asn Gly Lys Arg Val Tyr
 50 55 60

Ile Val Cys Thr Asp Ser Asp Ala Val Asp Tyr Lys Phe Tyr Ile Cys
 65 70 75 80

Phe Asp Met Asn Arg Leu Ser Gly Pro Pro Tyr Pro Glu Glu Glu Ile
 85 90 95

Leu Arg Glu Ser Thr Val Thr Tyr Ala Gln Ile Tyr Glu Leu Met Thr
 100 105 110

Thr Glu Thr Thr Glu Thr Lys Lys Pro Lys Lys Lys Pro Lys Asn Ser
 115 120 125

Lys Thr Asp Asp Pro Pro Ala Ile Arg Pro Gly Phe Ser Phe Arg Asn
 130 135 140

Ser Ile Ser Val
 145

<210> 28

<211> 826

<212> DNA

<213> Lutzomyia longipalpis

<400> 28

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tctatttgca atttttttat tagtgaaaag gtctcaggct tttcttccat ctgacccaag 120

tatctgtgtt aaaaatttag tattggatac aggaaggact tgtgaggaaa gtgaatat 180


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tccggatatc aagaacgtta aaaatggaaa aagagtttac attgtctgca ctgattcaga      240
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tcctgaggaa gaaatccttc gtgaatcaac ggtaacttat gcccaaattt atgagctgat      360
gactacggaa accactgaaa ccaaaaagcc aaaaaagaaa ccaaagaatt caaaaacgga      420
cccagaccct ccagcaattc gtccaggatt ttcatttaga aattcaattt ctgtttaatt      480
ttacaattta ttttgaaaga aaaatgatat ttcgaaatat tctatacaaa aaaacaacag      540
ttataaaacg aaaattcaat catttcaatg agaaaactta gtcttgagta aggtttattc      600
accacccgac gccacgctat ggtgaataat tttctttatt caccacatca aaatgacggc      660
ttataaactt caacaaatag tttggaaaat acatttctaa ctaatgcaat gtttacttaa      720
aatcacttta caaattcacg catttgagat gcaacaaata tatacaattc aacgatataa      780
actttccaca aggaaaactt tcaaccaaaa aaaaaaaaaa aaaaaa                      826

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<210> 29
<211> 397
<212> PRT
<213> Lutzomyia longipalpis

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<400> 29

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Met Lys Leu Phe Phe Phe Leu Tyr Thr Phe Gly Leu Val Gln Thr Ile
1           5           10           15

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Phe Gly Val Glu Ile Lys Gln Gly Phe Lys Trp Asn Lys Ile Leu Tyr
20           25           30

```

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Glu Gly Asp Thr Ser Glu Asn Phe Asn Pro Asp Asn Asn Ile Leu Thr
35           40           45

```

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Ala Phe Ala Tyr Asp Pro Glu Ser Gln Lys Leu Phe Leu Thr Val Pro
50           55           60

```

```

Arg Lys Tyr Pro Glu Thr Met Tyr Thr Leu Ala Glu Val Asp Thr Glu
65           70           75           80

```

```

Lys Asn Ser Phe Glu Ser Gly Asp Thr Ser Pro Leu Leu Gly Lys Phe
85           90           95

```

```

Ser Gly His Glu Thr Gly Lys Glu Leu Thr Ser Val Tyr Gln Pro Val
100          105          110

```

```

Ile Asp Glu Cys His Arg Leu Trp Val Val Asp Val Gly Ser Val Glu
115          120          125

```

Arg Asn Ser Asp Gly Thr Glu Gly Gln Pro Glu His Asn Pro Thr Leu
 130 135 140

Val Ala Tyr Asp Leu Lys Glu Ala Asn Tyr Pro Glu Val Ile Arg Tyr
 145 150 155 160

Thr Phe Pro Asp Asn Ser Ile Glu Lys Pro Thr Phe Leu Gly Gly Phe
 165 170 175

Ala Val Asp Val Val Lys Pro Asp Glu Cys Ser Glu Thr Phe Val Tyr
 180 185 190

Ile Thr Asn Phe Leu Thr Asn Ala Leu Ile Val Tyr Asp His Lys Asn
 195 200 205

Lys Asp Ser Trp Thr Val Gln Asp Ser Thr Phe Gly Pro Asp Lys Lys
 210 215 220

Ser Lys Phe Asp His Asp Gly Gln Gln Tyr Glu Tyr Glu Ala Gly Ile
 225 230 235 240

Phe Gly Ile Thr Leu Gly Glu Arg Asp Asn Glu Gly Asn Arg Gln Ala
 245 250 255

Tyr Tyr Leu Val Ala Ser Ser Thr Lys Leu His Ser Ile Asn Thr Lys
 260 265 270

Glu Leu Lys Gln Lys Gly Ser Lys Val Asn Ala Asn Tyr Leu Gly Asp
 275 280 285

Arg Gly Glu Ser Thr Asp Ala Ile Gly Leu Val Tyr Asp Pro Lys Thr
 290 295 300

Lys Thr Ile Phe Phe Val Glu Ser Asn Ser Lys Arg Val Ser Cys Trp
 305 310 315 320

Asn Thr Gln Glu Thr Leu Asn Lys Asp Lys Ile Asp Val Ile Tyr His
 325 330 335

Asn Ala Asp Phe Ser Phe Gly Thr Asp Ile Ser Ile Asp Ser Gln Asp
 340 345 350

Asn Leu Trp Phe Leu Ala Asn Gly Leu Pro Pro Leu Glu Asn Ser Asp
 355 360 365

Lys Phe Val Phe Thr Lys Pro Arg Tyr Gln Ile Phe Lys Val Asn Ile
 370 375 380

Gln Glu Ala Ile Ala Gly Thr Lys Cys Glu Lys Asn Leu
 385 390 395

<210> 30

<211> 1325

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 30

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tccaaacgat ttttggagta gaaattaaac aaggatttaa atggaataaa atcctttatg      120
agggcgatac atcagaaaac ttcaatccag ataacaacat ccttacggct tttgcgtacg      180
atcctgagag tcagaaactc ttctaactg tcccgaggaa atatcccgaa actatgtaca      240
ctttggcaga agttgatact gagaaaaatt cttttgaatc gggagatact tccccgctcc      300
ttggaaaatt cagtgggtcat gaaactggga aagaacttac atcagtttat cagccagtta      360
tcgatgaatg tcatcgctct tgggttggtg atgttggatc agtagaacgt aactcagacg      420
gcacagaagg tcagccagaa cataatccta cccttggtggc gtacgatctc aaagaagcca      480
actatcctga agttattcgt tacacgtttc ccgataattc cattgagaag cccacatttc      540
tggttggtgatt tgccgttgat gttgtaaagc cggatgaatg cagtgaaact tttgtctaca      600
tcacaaactt cctcaccaac gccctcatag tatacgatca taagaataag gactcctgga      660

agtatgaata cgaagcagga atcttcggga ttacccttgg agagagagat aacgaaggaa      780
atcgtcaagc gtactattta gtagcaagta gtaccaaact tcacagcatc aacaccaaaag      840
aactgaagca aaaaggaagc aaagttaatg caaattatctt gggagatcgt ggtgaatcca      900
ccgatgccat aggcttagtt tacgatccaa aaaccaaacc tatcttcttc gttgagtcaa      960
atagcaaaag agtatcatgc tggaataccc aggaaacact aaacaaggat aaaattgatg     1020
taatctatca caatgcagac ttttcctttg gaacagatat atcgattgat agtcaggata     1080
atgtgtggtt cctagcaaat ggacttccac ctctggaaaa ttctgataaa tttgtcttta     1140
caaagccacg ttatcaaata ttcaaagtca acattcaaga agcaattgct ggaactaaat     1200
gtgaaaagaa tctttaacaa atgaaacttt gtagaaaaat acataatatc tgaataaaaa     1260
gtcataaatg taccataaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa     1320
aaaaa                                           1325

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<210> 31
 <211> 350
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 31

Met Thr Phe Leu Ile Ile Leu Gly Ala Phe Leu Leu Val Gln Ile Ile
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Thr Ala Ser Ala Leu Gly Leu Pro Glu Gln Phe Lys Gly Leu Glu Asp
 20 25 30

Leu Pro Lys Lys Pro Leu Ala Glu Thr Tyr Tyr His Glu Gly Leu Asn
 35 40 45

Asp Gly Lys Thr Asp Glu Met Val Asp Ile Phe Lys Ser Leu Ser Asp
 50 55 60

Glu Phe Lys Phe Ser Asp Glu Asn Leu Asp Val Gly Glu Glu Lys Asn
 65 70 75 80

Tyr Lys Lys Arg Asp Ile Thr Gln Asn Ser Val Ala Arg Asn Phe Leu
 85 90 95

Ser Asn Val Lys Gly Ile Pro Ser Met Pro Ser Leu Pro Ser Met Pro
 100 105 110

Ser Met Pro Ser Ile Pro Ser Leu Trp Ser Ser Gln Thr Gln Ala Ala
 115 120 125

Pro Asn Thr Ala Leu Ala Leu Pro Glu Ser Asp Tyr Ser Leu Leu Asp
 130 135 140

Met Pro Asn Ile Val Lys Asn Phe Leu Lys Glu Thr Arg Asp Leu Tyr
 145 150 155 160

Asn Asp Val Gly Ala Phe Leu Lys Ala Ile Thr Glu Ala Leu Thr Asn
 165 170 175

Arg Ser Ser Ser Ser Gln Leu Leu Ser Ser Pro Met Val Ser Thr Asn
 180 185 190

Lys Thr Lys Glu Phe Ile Arg Asn Glu Ile Gln Lys Val Arg Lys Val
 195 200 205

Arg Asn Phe Val Gln Glu Thr Leu Gln Lys Ile Arg Asp Ile Ser Ala
 210 215 220

Ala Ile Ala Lys Lys Val Lys Ser Ser Glu Cys Leu Ser Asn Leu Thr
 225 230 235 240

Asp Ile Lys Gly Leu Val Ser Asp Gly Ile Asn Cys Leu Lys Glu Lys
 245 250 255

Phe Asn Asp Gly Lys Arg Ile Ile Leu Gln Leu Tyr Asn Asn Leu Leu
 260 265 270

Lys Gly Leu Lys Ile Pro Asn Asp Leu Met Val Glu Leu Lys Lys Cys
 275 280 285

Asp Thr Asn Gln Asn Asn Thr Leu Gly Arg Ile Ile Cys Tyr Phe Leu
 290 295 300

Thr Pro Leu Gln Leu Glu Lys Glu Gln Ile Leu Leu Pro Val Glu Phe
 305 310 315 320

Ile Lys Arg Ile Leu Glu Leu Thr His Tyr Phe Ser Thr Met Lys Glu
 325 330 335

Asp Leu Ile Asn Cys Gly Ile Thr Thr Ile Ala Ser Ile Thr
 340 345 350

<210> 32

<211> 1275

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 32

ctttaaagca aaaattttgt gggaaaggaa gttacccgga gatgacgttt ctaattatac	60
ttggtgcatt tctccttggt caaattatta cagcttcagc tttaggattg cctgaacagt	120
ttaaagggttt agaggattta cctaaaaaac ctttggcaga gacttattat cacgaaggat	180
tgaatgatgg aaaaacggat gaaatggtgg atatttttaa aagtcttagc gatgaattta	240
aattcagtga tgaaaattta gatgttggtg aggagaaaaa ttacaagaaa cgtgatataa	300
cccaaaattc agtggcaagg aacttcctat caaacgtaaa ggaattcct tcaatgccat	360
cactcccttc aatgccttca atgccatcaa ttccttcact ttggtcaagt cagacacagg	420
cggcacaaa taccgcactt gcccttcctg aatctgatta ttccttcta gatatgccga	480
atattgtgaa aaatttccta aaggaaacaa gagacctcta taacgatgtt ggagcttttc	540
ttaaggcaat tacagaagct ttaacaaata gatcttcac atctcaactt ctttctctcc	600
caatggtgag cacgaataaa accaaagaat ttattcggaa tgaaatacaa aaagtccgaa	660

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aagtgagaaa tttcgtccag gaaactcttc agaaaatccg agacatttct gctgctattg      720
ccaaaaaggt aaaatcatca gaatgtctgt ccaatcttac ggacatcaaa ggacttgtat      780
cagacggaat taattgttta aaggaaaaat tcaatgatgg aaaacgaatt atcctgcaat      840
tgtacaataa ttactaaaaa ggactcaaaa ttccaaatga cctaattggtt gaattgaaga      900
aatgtgatac aaatcaaaac aatacttttg gaagaataat ctgttatattt ttgacaccat      960
tgcaactgga aaaagaacaa attcttctac ctgtagaatt tataaagcgc attcttgaat     1020
taaccacta cttttccaca atgaaagaag atcttatcaa ctgtggcatc acaacgattg     1080
catccattac gtaaaaaatg gaaaaatgtg ccggtgaaat gcttgaaatc accaaagaaa     1140
tttcatcgca aataacagtt ccagaataac caaattttta tgattacttc tcaaggaaaa     1200
tactaccaa aggcattaat taaaacgatg ttttttataa acaatgtaag aaaaaaaaaa     1260
aaaaaaaaaa aaaaaa                                                    1275

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<210> 33
<211> 60
<212> PRT
<213> Lutzomyia longipalpis

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<400> 33

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Met Leu Lys Ile Val Leu Phe Leu Ser Val Leu Ala Val Leu Val Ile
1           5           10           15

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Cys Val Ala Ala Met Pro Gly Ser Asn Val Pro Trp His Ile Ser Arg
          20           25           30

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Glu Glu Leu Glu Lys Leu Arg Glu Ala Arg Lys Asn His Lys Ala Leu
          35           40           45

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Glu Lys Ala Ile Asp Glu Leu Ile Asp Lys Tyr Leu
          50           55           60

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<210> 34
<211> 413
<212> DNA
<213> Lutzomyia longipalpis

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<400> 34

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agttaatctt ctgtcaagct acaaaaatgc ttaaaatcgt tttatttcta tcagtttttg      60
ctgtattagt gatttgtgta gcagcaatgc caggatccaa tgttccttgg cacatttcac     120
gagaagagct tgagaagctt cgtgaagctc gaaagaatca caaggcactc gagaaggcaa     180
ttgatgaatt aattgacaaa tatctctgat tttgaagagc aaggaagagg aaataaacgg     240

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ccgaggaagg attttcttta gagattcttc tttttattac ttcaaacctt acttcaaaat 300
 cagtctgata tttttttaat ttgaaaaaaa tattgaaaat tttaactatt tgtgaaattt 360
 aaataaataa agaatgtcag aagcaaaaaa aaaaaaaaaa aaaaaaaaaa aaa 413

<210> 35
 <211> 120
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 35

Met Lys Phe Ser Cys Pro Val Phe Val Ala Ile Phe Leu Leu Cys Gly
 1 5 10 15

Phe Tyr Arg Val Glu Gly Ser Ser Gln Cys Glu Glu Asp Leu Lys Glu
 20 25 30

Glu Ala Glu Ala Phe Phe Lys Asp Cys Asn Glu Ala Lys Ala Asn Pro
 35 40 45

Gly Glu Tyr Glu Asn Leu Thr Lys Glu Glu Met Phe Glu Glu Leu Lys
 50 55 60

Glu Tyr Gly Val Ala Asp Thr Asp Met Glu Thr Val Tyr Lys Leu Val
 65 70 75 80

Glu Glu Cys Trp Asn Glu Leu Thr Thr Thr Asp Cys Lys Arg Phe Leu
 85 90 95

Glu Glu Ala Glu Cys Phe Lys Lys Lys Asn Ile Cys Lys Tyr Phe Pro
 100 105 110

Asp Glu Val Lys Leu Lys Lys Lys
 115 120

<210> 36
 <211> 428
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 36

aattttcacc atgaagtttt cttgcccagt tttcgttgca attttccttt tgtgcggatt 60
 ttatcgtggt gaggggtcat cacaatgtga agaagattta aaagaagaag ctgaagcttt 120
 cttaaggat tgcaatgaag caaaagccaa tcctggtgaa tacgagaate tcaccaaaga 180
 agaaatgttt gaagaattga aagaatatgg agttgctgac acagacatgg agacagttta 240
 caaacttggtg gaagaatggt ggaatgaatt aacaacaacg gattgtaaga gatttctcga 300

agaggctgaa tgcttcaaga agaagaatat ttgtaaatat ttcccagatg aagtgaaatt 360
gaagaagaaa taaattttta gcttgaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 420
aaaaaaaaa 428

<210> 37
<211> 572
<212> PRT
<213> *Lutzomyia longipalpis*

<400> 37

Met Leu Phe Phe Leu Asn Phe Phe Val Leu Val Phe Ser Ile Glu Leu
1 5 10 15

Ala Leu Leu Thr Ala Ser Ala Ala Ala Glu Asp Gly Ser Tyr Glu Ile
20 25 30

Ile Ile Leu His Thr Asn Asp Met His Ala Arg Phe Asp Gln Thr Asn
35 40 45

Ala Gly Ser Asn Lys Cys Gln Glu Lys Asp Lys Ile Ala Ser Lys Cys
50 55 60

Tyr Gly Gly Phe Ala Arg Val Ser Thr Met Val Lys Lys Phe Arg Glu
65 70 75 80

Glu Asn Gly Ser Ser Val Leu Phe Leu Asn Ala Gly Asp Thr Tyr Thr
85 90 95

Gly Thr Pro Trp Phe Thr Leu Tyr Lys Glu Thr Ile Ala Thr Glu Met
100 105 110

Met Asn Ile Leu Arg Pro Asp Ala Ala Ser Leu Gly Asn His Glu Phe
115 120 125

Asp Lys Gly Val Glu Gly Leu Val Pro Phe Leu Asn Gly Val Thr Phe
130 135 140

Pro Ile Leu Thr Ala Asn Leu Asp Thr Ser Gln Glu Pro Thr Met Thr
145 150 155 160

Asn Ala Lys Asn Leu Lys Arg Ser Met Ile Phe Thr Val Ser Gly His
165 170 175

Arg Val Gly Val Ile Gly Tyr Leu Thr Pro Asp Thr Lys Phe Leu Ser
180 185 190

Asp Val Gly Lys Val Asn Phe Ile Pro Glu Val Glu Ala Ile Asn Thr
 195 200 205

Glu Ala Gln Arg Leu Lys Lys Glu Glu Asn Ala Glu Ile Ile Ile Val
 210 215 220

Val Gly His Ser Gly Leu Ile Lys Asp Arg Glu Ile Ala Glu Lys Cys
 225 230 235 240

Pro Leu Val Asp Ile Ile Val Gly Gly His Ser His Thr Phe Leu Tyr
 245 250 255

Thr Gly Ser Gln Pro Asp Arg Glu Val Pro Val Asp Val Tyr Pro Val
 260 265 270

Val Val Thr Gln Ser Ser Gly Lys Lys Val Pro Ile Val Gln Ala Tyr
 275 280 285

Cys Phe Thr Lys Tyr Leu Gly Tyr Phe Lys Val Thr Ile Asn Gly Lys
 290 295 300

Gly Asn Val Val Gly Trp Thr Gly Gln Pro Ile Leu Leu Asn Asn Asn
 305 310 315 320

Ile Pro Gln Asp Gln Glu Val Leu Thr Ala Leu Glu Lys Tyr Arg Glu
 325 330 335

Arg Val Glu Asn Tyr Gly Asn Arg Val Ile Gly Val Ser Arg Val Ile
 340 345 350

Leu Asn Gly Gly His Thr Glu Cys Arg Phe His Glu Cys Asn Met Gly
 355 360 365

Asn Leu Ile Thr Asp Ala Phe Val Tyr Ala Asn Val Ile Ser Thr Pro
 370 375 380

Met Ser Thr Asn Ala Trp Thr Asp Ala Ser Val Val Leu Tyr Gln Ser
 385 390 395 400

Gly Gly Ile Arg Ala Pro Ile Asp Pro Arg Thr Ala Ala Gly Ser Ile
 405 410 415

Thr Arg Leu Glu Leu Asp Asn Val Leu Pro Phe Gly Asn Ala Leu Tyr
 420 425 430

Val Val Lys Val Pro Gly Asn Val Leu Arg Lys Ala Leu Glu His Ser
 435 440 445

Val His Arg Tyr Ser Asn Thr Ser Gly Trp Gly Glu Phe Pro Gln Val
 450 455 460

Ser Gly Leu Lys Ile Arg Phe Asn Val Asn Glu Glu Ile Gly Lys Arg

Val Lys Ser Val Lys Val Leu Cys Ser Asn Cys Ser Gln Pro Glu Tyr
 485 490 495

Gln Pro Leu Arg Asn Lys Lys Thr Tyr Asn Val Ile Met Asp Ser Phe
 500 505 510

Met Lys Asp Gly Gly Asp Gly Tyr Ser Met Phe Lys Pro Leu Lys Ile
 515 520 525

Ile Lys Thr Leu Pro Leu Gly Asp Ile Glu Thr Val Glu Ala Tyr Ile
 530 535 540

Glu Lys Met Gly Pro Ile Phe Pro Ala Val Glu Gly Arg Ile Thr Val
 545 550 555 560

Leu Gly Gly Leu Gln Lys Ser Asp Glu Asp Trp His
 565 570

<210> 38
 <211> 1839
 <212> DNA
 <213> Lutzomyia longipalpis

<400> 38
 agttgcaaga atttcttcat tgcgttaaga tgttgttttt ccttaacttt tttgtgctgg 60
 tgttcagcat agaactggcg ttgttaacag catcagcagc agcagaagac ggcagctatg 120
 agatcataat tcttcacacc aatgatatgc acgcgcgttt tgatcaaacc aatgctggaa 180
 gcaacaaatg ccaagaaaaa gacaagattg cttccaaatg ctacggagga tttgcaagag 240
 tttcaacaat ggtgaaaaaa ttccgagaag aaaatggcag cagtgtcttg ttcttgaatg 300
 ctggtgacac gtatacaggt accccatggg ttaccctcta caaggagacc attgcaacgg 360
 agatgatgaa catccttcgt ccagatgcag cctcactggg aaatcatgaa ttcgacaaag 420
 gagtagaagg actcgtgcc aacatgacaa atgctaaaaa tctcaaacgc tcaatgattt 480
 tggacacttc tcaagagcca acaatgacca atgctaaaaa tctcaaacgc tcaatgattt 540
 ttacgggttc cgggcacaga gttgggtgtta ttggctacct aacgcctgat acaaaattcc 600

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tctcggacgt tggtaaagtt aatttttattc cggaagttga agccatcaat acggaagcac      660
agcgtctgaa gaaagaggaa aatgccgaaa taatcatcgt tgttggacat tcaggggttga      720
taaaagatcg agaaattgca gagaaatgcc cactgggttga cataattggt ggaggacatt      780
cacacacatt cctctacaca ggaagtcagc ctgatcgtga ggttcctgta gacgtttatc      840
ctgtttgttgt gacccaatcc agtgggaaga aagttccaat tgttcaagcc tattgcttta      900
caaagtattt ggggtacttt aaagtgacga tcaacggaaa aggaaatggt gtgggatgga      960
ctgggcagcc aattctcctt aataacaaca ttccccaaga tcaggaagtt ctactgctc     1020
ttgaaaagta cagagaacgc gtggaaaact atggaaatcg cgtaattgga gtttcccgty     1080
taattctcaa tgggggggcat actgaatgtc gtttccatga atgcaatatg ggtaatctca     1140
tcacggacgc ttttgtgtat gccaatgtaa tcagtacacc aatgagtacg aatgcctgga     1200
cagatgcaag tgttgttctg tatcaaagtg gtggcattcg tgccccaatt gatcctcgta     1260
ccgcggcagg gagcatcaca cgcctcgagt tggacaatgt tctaccattt gggaatgcac     1320
tgtacgtcgt aaaagttcct gggaatgtct tacgcaaagc tttggaacat tcagttcatc     1380
gatactccaa cacttcggga tgggggagaat ttccacaagt ttcggggcta aagattcggt     1440
ttaacgtcaa tgaagaaatt ggaaaacgcg taaagtccgt taaagttctc tgtagcaatt     1500
gctctcaacc tgaataccaa ccactgagaa ataaaaaac ttacaacggt atcatggaca     1560
gttttatgaa ggatggaggt gatgggtata gcatgttcaa gcccttgaag atcatcaaga     1620
ccctcccact gggagatatt gaaacagtag aagcttatat tgagaaaatg ggccccattt     1680
tcccagcagt cgaggggaagg atcactgttc ttgggggact tcaaaaatca gatgaggatt     1740
ggcattagaa acatcctgga cgttatggaa agaataaaaag aaggatcata gaaaaaaaaa     1800
aaaaaaaaat aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa     1839

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<210> 39

<211> 86

<212> PRT

<213> *Lutzomyia longipalpis*

<400> 39

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Met Lys Gln Ile Leu Leu Ile Ser Leu Val Val Ile Leu Ala Val Leu
1           5           10           15

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Ala Phe Asn Val Ala Glu Gly Cys Asp Ala Thr Cys Gln Phe Arg Lys
          20           25           30

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Ala Ile Glu Asp Cys Lys Lys Lys Ala Asp Asn Ser Asp Val Leu Gln
          35           40           45

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Thr Ser Val Gln Thr Thr Ala Thr Phe Thr Ser Met Asp Thr Ser Gln
 50 55 60

Leu Pro Gly Asn Asn Val Phe Lys Ala Cys Met Lys Glu Lys Ala Lys
 65 70 75 80

Glu Phe Arg Ala Gly Lys
 85

<210> 40
 <211> 419
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 40
 gtcagtgatc tgataagtta ttaaaatgaa gcaaatacctt ctaatctctt tgggtggtgat 60
 tcttgccgtg cttgccttca atgttgctga gggctgtgat gcaacatgcc aatttcgcaa 120
 agccatagaa gactgcaaga agaaggcgga taatagcgat gttttgcaga cttctgtaca 180
 aacaactgca acattcacat caatggatac atcccaacta cctggaaata atgtcttcaa 240
 agcatgcatg aaggagaagg ctaaggaatt tagggcagga aagtaagaga ttgaggaaaa 300
 ttgtagccga agagagaagg aaggaaagtc ccatattttg tttgttaatt gtaacgaatt 360
 ttgcgaaaaa aataaaatat tatgcactcc aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 419

<210> 41
 <211> 84
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 41

Met Asn Val Leu Phe Val Ser Phe Thr Leu Thr Ile Leu Leu Leu Cys
 1 5 10 15

Val Lys Ala Arg Pro Glu Asp Phe Val Ala Leu Gln Asp Gln Ala Asn
 20 25 30

Phe Gln Lys Cys Leu Glu Gln Tyr Pro Glu Pro Asn Gln Ser Gly Glu
 35 40 45

Val Leu Ala Cys Leu Lys Lys Arg Glu Gly Ala Lys Asp Phe Arg Glu
 50 55 60

Lys Arg Ser Leu Asp Asp Ile Glu Gly Thr Phe Gln Glu Ser Gly Asn
 65 70 75 80

Leu Trp Gly Ala

<210> 42
 <211> 429
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 42
 tattttttaat aattctgtgt aaaatgaacg ttcttttcgt gtctttcacg ctcacaattc 60
 ttctttctctg tgttaaggca cggccagaag atttcgtagc tcttcaggat caagctaatt 120
 tccagaaatg cctcgaacaa tatccagaac caaatcaatc tggagaagtt cttgcgtgcc 180
 tcaagaagcg cgaagggtgcc aaagatttcc gggaaaagag gagcctggat gacatagaag 240
 ggactttcca agagtctgga aatctctggg gtgcatagga agctcagagg acttctaate 300
 aatctgtgag aagagaaccc aacggctaga gaaaatttaa ggaaaataaa gaaattaatg 360
 aagcattaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa 420
 aaaaaaaaaa 429

<210> 43
 <211> 626
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 43

Met Lys Ile Thr Val Ile Leu Phe Thr Gly Phe Thr Ile Ala Leu Val
 1 5 10 15

Ser Ser Ala Val Leu Lys Lys Asn Gly Glu Thr Ile Glu Glu Glu Glu
 20 25 30

Val Arg Ala Glu Gln Arg Leu Arg Glu Ile Asn Glu Glu Leu Asp Arg
 35 40 45

Arg Lys Asn Ile Asn Thr Val Ala Ala Trp Ala Tyr Ala Ser Asn Ile
 50 55 60

Thr Glu Val Asn Leu Lys Asn Met Asn Asp Val Ser Val Glu Thr Ala
 65 70 75 80

Lys Tyr Tyr Lys Glu Leu Ala Ser Glu Leu Lys Gly Phe Asn Ala Lys
 85 90 95

Glu Tyr Lys Ser Glu Asp Leu Lys Arg Gln Ile Lys Lys Leu Ser Lys
 100 105 110

Leu Gly Tyr Ser Ala Leu Pro Ser Glu Lys Tyr Lys Glu Leu Leu Glu
 115 120 125

Ala Ile Thr Trp Met Glu Ser Asn Tyr Ala Lys Val Lys Val Cys Ser
 130 135 140

Tyr Lys Asp Pro Lys Lys Cys Asp Leu Ala Leu Glu Pro Glu Ile Thr
 145 150 155 160

Glu Ile Leu Ile Lys Ser Arg Asp Pro Glu Glu Leu Lys Tyr Tyr Trp
 165 170 175

Lys Gln Trp Tyr Asp Lys Ala Gly Thr Pro Thr Arg Glu Ser Phe Asn
 180 185 190

Lys Tyr Val Gln Leu Asn Arg Glu Ala Ala Lys Leu Asp Gly Phe Tyr
 195 200 205

Ser Gly Ala Glu Ser Trp Leu Asp Glu Tyr Glu Asp Glu Thr Phe Glu
 210 215 220

Lys Gln Leu Glu Asp Ile Phe Ala Gln Ile Arg Pro Leu Tyr Glu Gln
 225 230 235 240

Leu His Ala Tyr Val Arg Phe Lys Leu Arg Glu Lys Tyr Gly Asn Asp
 245 250 255

Val Val Ser Glu Lys Gly Pro Ile Pro Met His Leu Leu Gly Asn Met
 260 265 270

Trp Gly Gln Thr Trp Ser Glu Val Ala Pro Ile Leu Val Pro Tyr Pro
 275 280 285

Glu Lys Lys Leu Leu Asp Val Thr Asp Glu Met Val Lys Gln Gly Tyr
 290 295 300

Thr Pro Ile Ser Met Phe Glu Lys Gly Asp Glu Phe Phe Gln Ser Leu
 305 310 315 320

Asn Met Thr Lys Leu Pro Lys Thr Phe Trp Glu Tyr Ser Ile Leu Glu
 325 330 335

Lys Pro Gln Asp Gly Arg Glu Leu Ile Cys His Ala Ser Ala Trp Asp
 340 345 350

Phe Tyr Thr Lys Asp Asp Val Arg Lys Gln Cys Thr Arg Val Thr Met
 355 360 365

Asp Gln Phe Phe Thr Ala His His Glu Leu Gly His Ile Gln Tyr Tyr
 370 375 380

Leu Gln Tyr Gln His Leu Pro Ser Val Tyr Arg Glu Gly Ala Asn Pro
 385 390 395 400

Gly Phe His Glu Ala Val Gly Asp Val Leu Ser Leu Ser Val Ser Ser
 405 410 415

Pro Lys His Leu Glu Lys Val Gly Leu Leu Lys Asp Phe Lys Phe Asp
 420 425 430

Glu Glu Ser Gln Ile Asn Gln Leu Leu Asn Leu Ala Leu Asp Lys Met
 435 440 445

Ala Phe Leu Pro Phe Ala Tyr Thr Ile Asp Lys Tyr Arg Trp Gly Val
 450 455 460

Phe Arg Gly Glu Ile Ser Pro Ser Glu Tyr Asn Cys Lys Phe Trp Glu
 465 470 475 480

Met Arg Ser Tyr Tyr Gly Gly Ile Glu Pro Pro Ile Ala Arg Ser Glu
 485 490 495

Ser Asp Phe Asp Pro Pro Ala Lys Tyr His Ile Ser Ser Asp Val Glu
 500 505 510

Tyr Leu Arg Tyr Leu Val Ser Phe Ile Ile Gln Phe Gln Phe His Gln
 515 520 525

Ala Val Cys Gln Lys Thr Gly Gln Phe Val Pro Asn Asp Pro Glu Lys
 530 535 540

Thr Leu Leu Asn Cys Asp Ile Tyr Gln Ser Ala Glu Ala Gly Asn Ala
 545 550 555 560

Phe Lys Glu Met Leu Lys Leu Gly Ser Ser Lys Pro Trp Pro Asp Ala
 565 570 575

Met Glu Ile Leu Thr Gly Gln Arg Lys Met Asp Ala Ser Ala Leu Ile
 580 585 590

Glu Tyr Phe Arg Pro Leu Ser Glu Trp Leu Gln Lys Lys Asn Lys Glu
 595 600 605

Leu Gly Ala Tyr Val Gly Trp Asp Lys Ser Thr Lys Cys Val Lys Asn
 610 615 620

Val Ser
 625

<210> 44
 <211> 2121
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 44
 gtatatcaag tatcattcaa gtgaatcatt ggctccgtaa tttgtacaaa agaaaaaaaa 60

 gagtagtgct gtgcttaaga aaaacgggtga aactattgaa gaagaagaag taagagctga 180
 gcaacgactt agagagatca atgaggaact tgatcgtagg aagaatatca atactgtagc 240
 cgcttgggct tatgcatcca atattactga ggtcaatctc aagaacatga atgatgtgtc 300
 gggtgaaacc gcgaaatact acaaggaact tgcattctgaa ttgaagggat tcaatgccaa 360
 ggaatacaag agtgaggatc tgaagagaca aattaagaag ctaagcaagt tgggatatag 420
 tgctttacca tctgagaagt ataaggagct tttggaagct atcacatgga tggaatcgaa 480
 ttatgcaaaa gtgaaagttt gctcatataa ggatccaaag aaatgtgatt tagcacttga 540
 acctgaaatt acggaaatcc ttattaaaag tcgagatcct gaggaactta aatattattg 600
 gaaacaatgg tacgacaaaag ctggcacacc aactcgagag agttttaata agtatgtaca 660
 actaaatcgt gaagcagcga aattggatgg attttattcg ggtgcagaat cttggcttga 720
 tgaatatgaa gatgagacat ttgagaaaca acttgaggat atcttcgccc aaattcgccc 780
 actgtacgag caactccatg cttatgttag attcaagctg agggaaaagt atggaaatga 840
 cgttgtttcg gagaaaggct ccattccaat gcatctcttg gggaacatgt ggggtcaaac 900
 gtggagtga gttgccccaa ttttagtccc ataccccgaa aagaagctcc tcgatgttac 960
 cgatgagatg gttaagcagg gatacacacc aatttctatg tttgaaaaag gagacgaatt 1020
 tttccaaagc ttgaatatga cgaaacttcc aaaaaccttc tgggagtaca gtattttgga 1080
 aaaaccccaa gatggtaggg aattgatctg ccatgcaagt gcatgggact tctatacaaa 1140
 ggatgatgta aggattaaac agtgtaccag agttacaatg gatcaattct tcacgggtca 1200
 tcatgagctt ggtcacattc aatattatct gcaatatcaa catttgccga gtgtttacag 1260
 agaagggtgcc aatccaggct ttcacgaggc tgttggggat gttctctctc tttcgggtac 1320


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aagtcctaaa catttgga aaagttggttt gcttaaagac ttcaaatttg atgaagaatc 1380
ccagataaat caacttctaa atttagctct ggataaaatg gcattcctcc catttgccta 1440
taccattgat aaatatcgct ggggtgtgtt tcggggtgaa atttcgcctg ctgagtacaa 1500
ttgcaaattt tgggaaatgc gttcctacta tgggtggtata gaaccaccaa ttgcacgttc 1560
tgagagtgat tttgatccac cagcaaaata tcatatttca tcggatgttg agtacctcag 1620
gtatttggtt tccttcatta ttcagttcca attccatcaa gctgtgtgcc aaaagactgg 1680
tcagttcgta ccgaatgatc cggagaagac tcttctaaat tgtgacatct accagagtgc 1740
tgaggctggt aatgccttca aagaaatgct caaattggga tcctcaaaac catggccaga 1800
tgcaatggaa attcttacgg ggcaaaggaa aatggatgct tctgcattaa ttgagtactt 1860
ccgtccactc agtgagtggg tgcagaagaa gaataaggaa ctaggagctt atgttggtg 1920
ggacaaatct actaagtgtg tcaaaaacgt cagttaattt tttgtgagcc ctaaaaaata 1980
ttcataacat ttcaatatga caaaatatat gattttcgtg aaaactaagc atgagtaagt 2040
tttttttgtg aatttttagc agtttcattt cagaataaac gtcaaatttt taaaaaaaaa 2100
aaaaaaaaa aaaaaaaaaa a 2121

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<210> 45
<211> 42
<212> PRT
<213> Lutzomyia longipalpis

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<400> 45

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Met Lys Thr Phe Ala Leu Ile Phe Leu Ala Leu Ala Val Phe Val Leu
1           5           10          15

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Cys Ile Asp Gly Ala Pro Thr Phe Val Asn Leu Leu Asp Asp Val Gln
          20          25          30

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Glu Glu Val Glu Val Asn Thr Tyr Glu Pro
          35          40

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<210> 46
<211> 463
<212> DNA
<213> Lutzomyia longipalpis

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<400> 46
tcagttagtt gactaacaaa ccacaataga gacactaaaa tgaagacatt cgccttaatc 60
ttcttggctc ttgctgtttt tgtgctctgc attgacggag ctccaacttt tgtgaattta 120
ctggacgacg tacaggaaga ggtagaagtt aatacgtatg agccttagga agaaaatgtt 180
tgaggagttt caggcagagg cagagctttc ccagagaggg agcttttgcc ttgctgtaga 240

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tttttaaaaa tgaatcaatt tgattggagc aattacgcta tatttgtggg aatatttttg      300
aattaaaaaac taattatgga aattaatata taattttcag aatttcaata aattcatcaa      360
aattgtatta attaaaaaat attgtatgaa attcccaata aaagctttca aattaaaaaa      420
aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa aaa                          463

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<210> 47
<211> 139
<212> PRT
<213> Lutzomyia longipalpis

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<400> 47

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```

Met Asn His Leu Cys Phe Ile Ile Ile Ala Leu Phe Phe Leu Val Gln
1           5           10           15

```

```

Gln Ser Leu Ala Glu His Pro Glu Glu Lys Cys Ile Arg Glu Leu Ala
          20           25           30

```

```

Arg Thr Asp Glu Asn Cys Ile Leu His Cys Thr Tyr Ser Tyr Tyr Gly
          35           40           45

```

```

Phe Val Asp Lys Asn Phe Arg Ile Ala Lys Lys His Val Gln Lys Phe
          50           55           60

```

```

Lys Lys Ile Leu Val Thr Phe Gly Ala Val Pro Lys Lys Glu Lys Lys
65           70           75           80

```

```

Lys Leu Leu Glu His Ile Glu Ala Cys Ala Asp Ser Ala Asn Ala Asp
          85           90           95

```

```

Gln Pro Gln Thr Lys Asp Glu Lys Cys Thr Lys Ile Asn Lys Tyr Tyr
          100          105          110

```

```

Arg Cys Val Val Asp Gly Lys Ile Leu Pro Trp Asn Ser Tyr Ala Asp
          115          120          125

```

```

Ala Ile Ile Lys Phe Asp Lys Thr Leu Asn Val
          130          135

```

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<210> 48
<211> 579
<212> DNA
<213> Lutzomyia longipalpis

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<400> 48
ggccattatg gccggggata gaacttaatt gttgttaaaa tgaatcactt gtgctttatt      60

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attattgctc tattcttttt ggttcaacaa tctttggctg aacatccaga agaaaaatgt      120
attagagaat tggcgagaac tgatgaaaac tgcattcttc attgtacgta ttcgtactac      180
ggattcgttg ataaaaattt caggatcgct aaaaaacatg ttcaaaaatt caaaaaaatc      240
ctagttacat tcggcgctgt tcctaagaaa gaaaaaaaga aactttttaga gcacattgag      300
gcttggtcggg attctgcgaa tgctgatcaa cctcaaacta aagatgaaaa atgtacaaaa      360
ataaataagt actatcgttg tgttgtggat ggaaaaatat taccctggaa tagttatgct      420
gatgcaatca ttaagtttga taaaaccctt aacgtatgaa gcaaagatat tcgaaaaaaaa      480
aacatcaaga ttatgctgga aagaaaaaaaa taaaaaaaaa ttgtgctaata caaattgaat      540
taacgcttaa tgctatatta aaaaaaaaaa aaaaaaaaaa                        579

```

```

<210> 49
<211> 446
<212> PRT
<213> Lutzomyia longipalpis

```

```

<400> 49

```

```

Met Lys Ile Ile Phe Leu Ala Ala Phe Leu Leu Ala Asp Gly Ile Trp
1           5           10           15

```

```

Ala Ala Glu Glu Pro Ser Val Glu Ile Val Thr Pro Gln Ser Val Arg
          20           25           30

```

```

Arg His Ala Thr Pro Lys Ala Gln Asp Ala Arg Val Gly Ser Glu Ser
          35           40           45

```

```

Ala Thr Thr Ala Pro Arg Pro Ser Glu Ser Met Asp Tyr Trp Glu Asn
50           55           60

```

```

Asp Asp Phe Val Pro Phe Glu Gly Pro Phe Lys Asp Ile Gly Glu Phe
65           70           75           80

```

```

Asp Trp Asn Leu Ser Lys Ile Val Phe Glu Glu Asn Lys Gly Asn Ala
          85           90           95

```

```

Ile Leu Ser Pro Leu Ser Val Lys Leu Leu Met Ser Leu Leu Phe Glu
100           105           110

```

```

Ala Ser Ala Ser Gly Thr Leu Thr Gln His Gln Leu Arg Gln Ala Thr
115           120           125

```

```

Pro Thr Ile Val Thr His Tyr Gln Ser Arg Glu Phe Tyr Lys Asn Ile
130           135           140

```

Phe Asp Gly Leu Lys Lys Lys Ser Asn Asp Tyr Thr Val His Phe Gly
 145 150 155 160

Thr Arg Ile Tyr Val Asp Gln Phe Val Thr Pro Arg Gln Arg Tyr Ala
 165 170 175

Ala Ile Leu Glu Lys His Tyr Leu Thr Asp Leu Lys Val Glu Asp Phe
 180 185 190

Ser Lys Ala Lys Glu Thr Thr Gln Ala Ile Asn Ser Trp Val Ser Asn
 195 200 205

Ile Thr Asn Glu His Ile Lys Asp Leu Val Lys Glu Glu Asp Val Gln
 210 215 220

Asn Ser Val Met Leu Met Leu Asn Ala Val Tyr Phe Arg Gly Leu Trp
 225 230 235 240

Arg Lys Pro Phe Asn Arg Thr Leu Pro Leu Pro Phe His Val Ser Ala
 245 250 255

Asp Glu Ser Lys Thr Thr Asp Phe Met Leu Thr Asp Gly Leu Tyr Tyr
 260 265 270

Phe Tyr Glu Ala Lys Glu Leu Asp Ala Lys Ile Leu Arg Ile Pro Tyr
 275 280 285

Lys Gly Lys Gln Tyr Ala Met Thr Val Ile Leu Pro Asn Ser Lys Ser
 290 295 300

Gly Ile Asp Ser Phe Val Arg Gln Ile Asn Thr Val Leu Leu His Arg
 305 310 315 320

Ile Lys Trp Leu Met Asp Glu Val Glu Cys Arg Val Ile Leu Pro Lys
 325 330 335

Phe His Phe Asp Met Thr Asn Glu Leu Lys Glu Ser Leu Val Lys Leu
 340 345 350

Gly Ile Ser Gln Ile Phe Thr Ser Glu Ala Ser Leu Pro Ser Leu Ala
 355 360 365

Arg Gly Gln Gly Val Gln Asn Arg Leu Gln Val Ser Asn Val Ile Gln
 370 375 380

Lys Ala Gly Ile Ile Val Asp Glu Lys Gly Ser Thr Ala Tyr Ala Ala
 385 390 395 400

Ser Glu Val Ser Leu Val Asn Lys Phe Gly Asp Asp Glu Phe Val Met
 405 410 415

Phe Asn Ala Asn His Pro Phe Leu Phe Thr Ile Glu Asp Glu Thr Thr
 420 425 430

Gly Ala Ile Leu Phe Thr Gly Lys Val Val Asp Pro Thr Gln
 435 440 445

<210> 50
 <211> 1651
 <212> DNA
 <213> *Lutzomyia longipalpis*

<220>
 <221> misc_feature
 <222> (1636)..(1636)
 <223> n is a, c, g, or t

<400> 50
 gtcggagatc gtctgccttg atgatcacat cgtgattgtg agttacaaga gtgaaacttt 60
 ttaagtgtgt gtgtcttagc aaagtgattt ccacaatgaa gattatTTTT ttagccgctt 120
 ttctactagc ggatggtatt tgggctgctg aagaaccttc agtggaaatt gtaacaccac 180
 aatcagtgcg gagacacgct acgccaaaag cccaggacgc gagggtagga agtgaatccg 240
 caacaacagc accaagacca agtgaatcaa tggattactg ggagaatgat gatttcgtcc 300
 catttgaggg tccattcaag gatattggag aattcgactg gaacctttcg aagatcgttt 360
 ttgaggaaaa caaaggtaat gccatcttgt cgccactctc tgtgaagcta ctaatgagtt 420
 tgctcttcga ggccagtgcg tcaggtaact tgaccagca ccaactcaga caagccactc 480
 ccaccatcgt caccactat cagtctcgag aattttacaa gaatatcttt gacggtctca 540
 agaaaaagag taacgactac acggttcaact ttggtacgag aatctacgtg gatcagtttg 600
 tgacgcctcg ccagagatat gctgccattt tggagaagca ttatctgact gatctcaaag 660
 ttgaggactt ctcgaaggca aaagaaacaa ctcaggcaat caatagttgg gtgtcaaaca 720
 tcacaaatga gcacataaag gatctcgtga aggaggaaga tggttcagaat tcagttatgc 780
 tcatgcttaa tgcagtctac ttccgcgac tctggcgcaa gcctttcaat cgtacactcc 840
 cactgccctt ccacgtgagc gctgatgagt ccaagacgac tgattttatg ctaaccgatg 900
 ggctctacta cttctacgag gcaaaggaat tggatgctaa gatcctcaga attccttaca 960
 aaggtaaaca atacgcaatg actgtgatct taccaaattc caagagtggc attgatagct 1020

```

ttgtgcgtca gattaacacg gtcctcctgc acaggattaa gtggttgatg gatgaagtgg 1080
agtgcagggt tattctaccc aagttccact ttgacatgac gaatgagctg aaggaatcgc 1140
tcgtaaagtt gggcatcagt cagattttca catcagagggc atctttgccca tcattagcac 1200
gaggacaggg cgtacagaat cgtctgcagg tgtctaattgt gattcagaag gcggaataa 1260
ttgtggatga gaagggcagc acagcctatg ctgcgtcaga agtgagccta gtcaacaagt 1320
ttggagatga tgagttcgtc atgttcaacg ctaatcatcc attcctcttt acaattgagg 1380
acgaaaccac cggcgcaatc ctattttacgg gaaaagtcgt cgatcccacg caatagggaa 1440
tgaaaagcat ttcatcgtat acaacttttt ttttaattaa ttattcctca ttgaaggaca 1500
ttaatagagc atctttctcag gaaggcactc ctgacttatt tttactaaat gtgacacctg 1560
gacacataaa aaaaacagct gtactttcta ctttttataa tatacgacca tattttgtgag 1620
gaaaaaaaaa aaaaanaaaa aaaaaaaaaa a 1651

```

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<210> 51
<211> 166
<212> PRT
<213> Lutzomyia longipalpis

```

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<400> 51

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```

Met Arg Phe Leu Leu Leu Ala Phe Ser Val Ala Leu Val Leu Ser Pro
1           5           10           15

```

```

Thr Phe Ala Lys Pro Gly Leu Trp Asp Ile Val Thr Gly Ile Asn Asp
          20           25           30

```

```

Met Val Lys Asn Thr Ala Asn Ala Leu Lys Asn Arg Leu Thr Thr Ser
          35           40           45

```

```

Val Thr Leu Phe Thr Asn Thr Ile Thr Glu Ala Ile Lys Asn Ala Asn
50           55           60

```

```

Ser Ser Val Ser Glu Leu Leu Gln Gln Val Asn Glu Thr Leu Thr Asp
65           70           75           80

```

```

Ile Ile Asn Gly Val Gly Gln Val Gln Ser Ala Phe Val Asn Ser Ala
          85           90           95

```

```

Gly Asn Val Val Val Gln Ile Val Asp Ala Ala Gly Asn Val Leu Glu
          100          105          110

```

```

Val Val Val Asp Glu Ala Gly Asn Ile Val Glu Val Ala Gly Thr Ala
115           120           125

```

Leu Glu Thr Ile Ile Pro Leu Pro Gly Val Val Ile Gln Lys Ile Ile
 130 135 140

Asp Ala Leu Gln Gly Asn Ala Gly Thr Thr Ser Asp Ser Ala Ser Ser
 145 150 155 160

Thr Val Pro Gln Gln Ser
 165

<210> 52
 <211> 739
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 52
 tcagttaagc agattttcaa gctaaagaaa cttaactaag atgcgattcc ttcttttggc 60
 cttctccggt gctttgggtgc tttcaccaac attcgccaaa ccagggtcttt gggacattgt 120
 aactgggtatt aatgatattg taaaaaatac tgcgaatgca ctcaaaaatc gtctaacaac 180
 ttctgtgaca ttattcacaa ataccatcac cgaagctata aaaaatgcaa attcttctgt 240
 ttcggaactc cttcagcaag tcaatgaaac ccttacggat attattaatg gtgtaggaca 300
 agtgcagagt gcctttgtga attcagctgg aaatgttggt gtgcaaattg ttgatgccgc 360
 tggaaatggt ttggaagttg ttgttgatga ggctggaaat atcgtggagg tagctggaac 420
 agcattggaa actatcatte cactgcccgg tgtagtgatt cagaagataa ttgatgctct 480
 ccaaggaaat gcagggacta catcggattc agcttcatca actgtgcccc aacaatctta 540
 actacaaccg caatgatggt gtctttaacg gagaattttt aaatttgaat atcaaaatcc 600
 aagatgaaat attcagattt ttcaatcaat atgatacgaa attttgaaat tatttttccg 660
 actaaagcaa tttgtaaaag gaaaaccaa taaatatttg aaattgtaaa gaaaaaaaaa 720
 aaaaaaaaaa aaaaaaaaaa 739

<210> 53
 <211> 109
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 53

Met Val Lys Tyr Ser Cys Leu Val Leu Val Ala Ile Phe Leu Leu Ala
 1 5 10 15

Gly Pro Tyr Gly Val Val Gly Ser Cys Glu Asn Asp Leu Thr Glu Ala
 20 25 30

Ala Lys Tyr Leu Gln Asp Glu Cys Asn Ala Gly Glu Ile Ala Asp Glu
35 40 45

Phe Leu Pro Phe Ser Glu Glu Glu Val Gly Glu Ala Leu Ser Asp Lys
50 55 60

Pro Glu Asn Val Gln Glu Val Thr Asn Ile Val Arg Gly Cys Phe Glu
65 70 75 80

Ala Glu Gln Ala Lys Glu His Gly Lys Cys Glu Arg Phe Ser Ala Leu
85 90 95

Ser Gln Cys Tyr Ile Glu Lys Asn Leu Cys Gln Phe Phe
100 105

<210> 54

<211> 447

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 54

atatcaattt tatcatcatg gtgaagtact cgtgtcttgt tcttggtgca atttttcttc 60
tggccggacc ctacggcggt gtaggttctt gtgagaatga cctgacagag gccgccaagt 120
atcttcaaga tgaatgcaat gcaggtgaaa ttgcagatga atttctaccc ttctctgaag 180
aagaagtggg tgaagcattg agcgacaaac cagaaaacgt gcaggaagtc accaacatcg 240
tgagaggatg ctttgaagct gaacaagcca aagagcatgg aaaatgtgaa agattttccg 300
ctttgagtca atgctacatt gaaaagaatt tatgtcaatt cttctaaaat attttgaaga 360
aaagttatga atgaaaattt tctgaaattt tgttgcaaaa atatataaat tgcccaatta 420
aaaaaaaaa aaaaaaaaaa aaaaaaa 447

<210> 55

<211> 115

<212> PRT

<213> *Lutzomyia longipalpis*

<400> 55

Met Lys Phe Phe Tyr Leu Ile Phe Ser Ala Ile Phe Phe Leu Ala Asp
1 5 10 15

Pro Ala Leu Val Lys Cys Ser Glu Asp Cys Glu Asn Ile Phe His Asp
20 25 30

Asn Ala Tyr Leu Leu Lys Leu Asp Cys Glu Ala Gly Arg Val Asp Pro
35 40 45

Val Glu Tyr Asp Asp Ile Ser Asp Glu Glu Ile Tyr Glu Ile Thr Val
 50 55 60

Asp Val Gly Val Ser Ser Glu Asp Gln Glu Lys Val Ala Lys Ile Ile
 65 70 75 80

Arg Glu Cys Ile Ala Gln Val Ser Thr Gln Asp Cys Thr Lys Phe Ser
 85 90 95

Glu Ile Tyr Asp Cys Tyr Met Lys Lys Lys Ile Cys Asn Tyr Tyr Pro
 100 105 110

Glu Asn Met
 115

<210> 56
 <211> 496
 <212> DNA
 <213> Lutzomyia longipalpis

<400> 56
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 gatcctgctt tgggtcaagtg ttcagaggat tgtgagaata tttttcatga caatgcgtac 120
 ctccttaaat tggattgtga agcaggaagg gttgatcctg ttgaatacga cgatatttcg 180
 gatgaagaaa tatatgaaat aacggtcgat gttggagttt catctgagga ccaggagaaa 240
 gttgcgaaaa taataaggga gtgcattgca caagtttcaa cgcaagattg cagcaaat 300
 tcagaaattt atgattgtta catgaagaag aaaatctgta attattatcc tgaaaatatg 360
 taataaaaaa ttatttattt atataaaaaa atataaggat taaaatctct tattgattgt 420
 aaaaatggcc taatattgaa gcaaaaatta aagcatgaaa caagaccaa aaaaaaaaaa 480
 aaaaaaaaaa aaaaaa 496

<210> 57
 <211> 409
 <212> PRT
 <213> Lutzomyia longipalpis

<400> 57

Met His Leu Gln Leu Asn Leu Cys Ala Ile Leu Leu Ser Val Leu Asn
 1 5 10 15

Gly Ile Gln Gly Ala Pro Lys Ser Ile Asn Ser Lys Ser Cys Ala Ile
 20 25 30

Ser Phe Pro Glu Asn Val Thr Ala Lys Lys Glu Pro Val Tyr Leu Lys
 35 40 45
 Pro Ser Asn Asp Gly Ser Leu Ser Thr Pro Leu Gln Pro Ser Gly Pro
 50 55 60
 Phe Val Ser Leu Lys Ile Gly Glu Ser Leu Ala Ile Phe Cys Pro Gly
 65 70 75 80
 Asp Gly Lys Asp Val Glu Thr Ile Thr Cys Asn Thr Asn Phe Asp Leu
 85 90 95
 Ala Ser Tyr Ser Cys Asn Lys Ser Thr Ser Thr Asp Thr Ile Glu Thr
 100 105 110
 Glu Glu Val Cys Gly Gly Ser Gly Lys Val Tyr Lys Val Gly Phe Pro
 115 120 125
 Leu Pro Ser Gly Asn Phe His Ser Ile Tyr Gln Thr Cys Phe Asp Lys
 130 135 140
 Lys Asn Leu Thr Pro Leu Tyr Ser Ile His Ile Leu Asn Gly Gln Ala
 145 150 155 160
 Val Gly Tyr His Leu Lys His Thr Arg Gly Ser Phe Arg Thr Asn Gly
 165 170 175
 180 185 190
 Lys Phe Asn Lys Leu Phe Gly Pro Lys Gln Thr Phe Phe Arg Arg Pro
 195 200 205
 Leu Asn Phe Leu Ser Arg Gly His Leu Ser Pro Glu Val Asp Phe Thr
 210 215 220
 Phe Arg Arg Glu Gln His Ala Thr Glu Met Tyr Ile Asn Thr Ala Pro
 225 230 235 240
 Gln Tyr Gln Ser Ile Asn Gln Gly Asn Trp Leu Arg Val Glu Asn His
 245 250 255
 Val Arg Asp Leu Ala Lys Val Leu Gln Lys Asp Ile Thr Val Val Thr
 260 265 270
 Gly Ile Leu Gly Ile Leu Arg Leu Lys Ser Lys Lys Ile Glu Lys Glu

275	280	285
Ile Tyr Leu Gly Asp Asp Val Ile Ala Val Pro Ala Met Phe Trp Lys		
290	295	300
Ala Val Phe Asp Pro Gln Lys Gln Glu Ala Ile Val Phe Val Ser Ser		
305	310	315
Asn Asn Pro His Val Lys Thr Phe Asn Pro Asn Cys Lys Asp Val Cys		
325	330	335
Ala Gln Ala Gly Phe Gly Asn Asp Asn Leu Glu Tyr Phe Ser Asn Tyr		
340	345	350
Ser Ile Gly Leu Thr Ile Cys Cys Lys Leu Glu Glu Phe Val Lys Arg		
355	360	365
Asn Lys Ile Ile Leu Pro Lys Glu Val Asn Asn Lys Asn Tyr Thr Lys		
370	375	380
Lys Leu Leu Lys Phe Pro Lys Thr Arg Asn Lys Glu Gly Asp Lys Lys		
385	390	395
Val Val Arg Lys Arg Ala Lys Gly Ala		
405		

<210> 58
 <211> 1281
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 58
 tcaatctaac aatgcacctg caattgaatt tgtgcgctat tctcctttcg gtactaaatg 60
 gaattcaggg cgctcccaa agtattaatt caaaatcctg cgcaatctcc tttccggaga 120
 atgtaacggc taagaaggag ccagtggtact tgaaaccatc aaatgatggc tcattgagta 180
 cccccctaca gccaaagtggg ccatttgtaa gtctcaaaat tggagaatct cttgcaatct 240
 tctgtccagg tgatggaaag gacgtagaga caattacgtg caatacaaat ttcgatttag 300
 cttcatattc gtgcaacaag agcacatcaa cggataccat tgaaacggaa gaagtttgcg 360
 gaggaagtgg aaaagtgtac aaagttgggt ttccgctgcc ctctgggaat ttccattcaa 420
 tctaccaaac gtgttttgat aagaaaaatc tcacacctct ctactcaatt cacattctca 480
 atgggtcaagc tgttggatat caccttaagc acacaagagg aagctttcgt accaatggta 540
 tctacgggaa agtcaacatt gataaactct acaagacgca aattgagaaa ttcaacaaac 600

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ttttcggccc taaacaaaca tttttccgta gaccctcaa ttttctatca cgtggacact 660
taagccccga agtggacttt acattccgta gggaacaaca tgcaacggaa atgtacatta 720
acacagcacc acagtaccaa tcaattaatc aaggaaattg gctacgtgtt gaaaatcacg 780
tgagggatct cgcaaaagtt ctgcagaagg acataacagt cgttacggga attttgggga 840
tacttcggtt gaagagtaag aaaatagaga aagaaatcta tttaggagat gacgtaattg 900
ccgtaccagc aatgttctgg aaggctgttt ttgaccctca aaaacaagaa gcaattgtct 960
ttgtttcttc aaataatccc cacgtgaaga cttttaatcc caactgcaag gatgtatgcg 1020
ctcaagctgg atttgggaat gataatcttg aatatttctc caattattct attggtctga 1080
ctatttggtg caaacttgag gaatttgta aaagaaataa aataattcta cccaaagaag 1140
taaataacaa aaactacacc aaaaaactcc ttaagtttcc taaaacaaga aacaaggagg 1200
gagataagaa ggtggtacgt aagcgcgcca aaggagcata aatattaaac gaaaaaaaaa 1260
aaaaaaaaaa aaaaaaaaaa a 1281

```

<210> 59

<211> 160

<212> PRT

<213> *Lutzomyia longipalpis*

<400> 59

```

Met Asn Leu His Leu Ala Ile Ile Leu Phe Val Ser Tyr Phe Thr Leu
1           5           10           15

```

```

Ile Thr Ala Thr Asp Leu Ile Glu Lys Glu Leu Ser Asp Cys Lys Lys
20           25           30

```

```

Ile Phe Ile Ser Lys Ala Glu Leu Thr Trp Phe Gln Ala Leu Asp Phe
35           40           45

```

```

Cys Thr Glu Gln Asn Leu Thr Leu Leu Ser Ile Lys Ser Ala Arg Glu
50           55           60

```

```

Asn Asp Glu Val Thr Lys Ala Val Arg Ala Glu Val His Leu Pro Asp
65           70           75           80

```

```

Thr Lys Lys Ser His Ile Trp Leu Gly Gly Ile Arg Tyr Asp Gln Asp
85           90           95

```

```

Lys Asp Phe Arg Trp Ile Ser Asp Gly Thr Thr Val Thr Lys Thr Val
100          105          110

```

```

Tyr Ile Asn Trp Tyr Gln Gly Glu Pro Asn Gly Gly Arg Tyr Gln Lys

```

115 120 125
 Glu Phe Cys Met Glu Leu Tyr Phe Lys Thr Pro Ala Gly Gln Trp Asn
 130 135 140

Asp Asp Ile Cys Thr Ala Lys His His Phe Ile Cys Gln Glu Lys Lys
 145 150 155 160

<210> 60
 <211> 671
 <212> DNA
 <213> *Lutzomyia longipalpis*

<400> 60
 gttctacgat aaaatTTTct tttcaaactt ttctTTTtaa gaaaaatctt caaaaagtta 60
 aaatgaattt gcaccttgcg attatcctct ttgtgagtta cttcacactg atcactgcta 120
 cggatctaatt tgaaaaggaa ctttctgatt gcaaaaagat cttcatctcc aaggctgagc 180
 taacttggtt ccaagctctc gatttctgta ccgaacaaaa cctaactttg ctctcaatta 240
 aatccgcccg ggaaaatgat gaggtgacta aagcagttcg agctgaggtt catcttccag 300
 acacaaagaa gtctcacatt tggctcggag gtattcgta tgatcaagac aaggatttcc 360
 gttggataag cgatggaaca actgttacga agacagtcta catcaattgg taccaaggag 420
 aaccaaattg tgggaggtac caaaaggaat tttgtatgga attgtacttt aaaactccag 480
 ctggtcaatg gaatgatgat atttgtacag caaagcatca ttttatatgt caggagaaaa 540
 aataaattga attgttcatg tgtctttggc ggtgcgaagg tataattcag gttgacgaca 600
 taaattgatt tttctttcat taagaaaata aaggcttgaa tttataaaaa aaaaaaaaaa 660
 aaaaaaaaaa a 671

<210> 61
 <211> 160
 <212> PRT
 <213> *Lutzomyia longipalpis*

<400> 61

Met Asn Leu Pro Leu Ala Ile Ile Leu Phe Val Ser Tyr Phe Thr Leu
 1 5 10 15

Ile Thr Ala Ala Asp Leu Thr Glu Lys Glu Leu Ser Asp Gly Lys Lys
 20 25 30

Ile Phe Ile Ser Lys Ala Glu Leu Ser Trp Phe Asp Ala Leu Asp Ala
 35 40 45

Cys Thr Glu Lys Asp Leu Thr Leu Leu Thr Ile Lys Ser Ala Arg Glu
50 55 60

Asn Glu Glu Val Thr Lys Ala Val Arg Ala Glu Val His Leu Pro Asp
65 70 75 80

Thr Lys Lys Ser His Ile Trp Leu Gly Gly Ile Arg Tyr Asp Gln Asp
85 90 95

Lys Asp Phe Arg Trp Ile Ser Asp Gly Thr Thr Val Thr Lys Thr Val
100 105 110

Tyr Ile Asn Trp Tyr Gln Gly Glu Pro Asn Gly Gly Arg Tyr Gln Lys
115 120 125

Glu Phe Cys Met Glu Leu Tyr Phe Lys Thr Pro Ala Gly Gln Trp Asn
130 135 140

Asp Asp Ile Cys Thr Ala Lys His His Phe Ile Cys Gln Glu Lys Lys
145 150 155 160

<210> 62

<211> 672

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 62

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gttctacgat aaaat tttct tttcaaactt ttcttttaaa gaaaaatctt caaaaagtta      60
aatgaattt gcccttgcg attatcctct ttgtgagtta cttcacactg atcactgctg      120
cggatctaac tgaaaaggaa ctttctgatg gcaaaaagat cttcatctcc aaggctgagc      180
taagttgggt cgatgctctc gatgcctgta ccgaaaaaga cctaactttg ctcacaatta      240
aatccgcccg ggaaaatgag gaagtgacta aagcagttcg agctgaggtt catcttccag      300
acacaaagaa gtctcacatt tggctcggag gtattcgta tgatcaagac aaggatttcc      360
gttgataag cgatggaaca actgttacga agacagtcta catcaattgg taccaaggag      420
aaccaaattg tgggaggtac caaaaggaat tttgtatgga attgtacttt aaaactccag      480
ctggatcaat gaatgatgat atttgtacag caaagcatca ttttatatgt caggagaaaa      540
aataaattga attgttcatg tgtctttggc ggtgcgaagg tataattcag gttgacgaca      600
taaattgatt tttctttcat taagaaaata aaggcttgaa tttagcaaaa aaaaaaaaaa      660
aaaaaaaaaa aa                                     672
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<210> 63

<211> 399

<212> PRT

<213> *Lutzomyia longipalpis*

<400> 63

Met Lys Val Phe Phe Ser Ile Phe Thr Leu Val Leu Phe Gln Gly Thr
 1 5 10 15

Leu Gly Ala Asp Thr Gln Gly Tyr Lys Trp Lys Gln Leu Leu Tyr Asn
 20 25 30

Asn Val Thr Pro Gly Ser Tyr Asn Pro Asp Asn Met Ile Ser Thr Ala
 35 40 45

Phe Ala Tyr Asp Ala Glu Gly Glu Lys Leu Phe Leu Ala Val Pro Arg
 50 55 60

Lys Leu Pro Arg Val Pro Tyr Thr Leu Ala Glu Val Asp Thr Lys Asn
 65 70 75 80

Ser Leu Gly Val Lys Gly Lys His Ser Pro Leu Leu Asn Lys Phe Ser
 85 90 95

Gly His Lys Thr Gly Lys Glu Leu Thr Ser Ile Tyr Gln Pro Val Ile
 100 105 110

Asp Asp Cys Arg Arg Leu Trp Val Val Asp Ile Gly Ser Val Glu Tyr
 115 120 125

Arg Ser Arg Gly Ala Lys Asp Tyr Pro Ser His Arg Pro Ala Ile Val
 130 135 140

Ala Tyr Asp Leu Lys Gln Pro Asn Tyr Pro Glu Val Val Arg Tyr Tyr
 145 150 155 160

Phe Pro Thr Arg Leu Val Glu Lys Pro Thr Tyr Phe Gly Gly Phe Ala
 165 170 175

Val Asp Val Ala Asn Pro Lys Gly Asp Cys Ser Glu Thr Phe Val Tyr
 180 185 190

Ile Thr Asn Phe Leu Arg Gly Ala Leu Phe Ile Tyr Asp His Lys Lys
 195 200 205

Gln Asp Ser Trp Asn Val Thr His Pro Thr Phe Lys Ala Glu Arg Pro
 210 215 220

Thr Lys Phe Asp Tyr Gly Gly Lys Glu Tyr Glu Phe Lys Ala Gly Ile
225 230 235 240

Phe Gly Ile Thr Leu Gly Asp Arg Asp Ser Glu Gly Asn Arg Pro Ala
245 250 255

Tyr Tyr Leu Ala Gly Ser Ala Ile Lys Val Tyr Ser Val Asn Thr Lys
260 265 270

Glu Leu Lys Gln Lys Gly Gly Lys Leu Asn Pro Glu Leu Leu Gly Asn
275 280 285

Arg Gly Lys Tyr Asn Asp Ala Ile Ala Leu Ala Tyr Asp Pro Lys Thr
290 295 300

Lys Val Ile Phe Phe Ala Glu Ala Asn Thr Lys Gln Val Ser Cys Trp
305 310 315 320

Asn Thr Gln Lys Met Pro Leu Arg Met Lys Asn Thr Asp Val Val Tyr
325 330 335

Thr Ser Ser Arg Phe Val Phe Gly Thr Asp Ile Ser Val Asp Ser Lys
340 345 350

Gly Gly Leu Trp Phe Met Ser Asn Gly Phe Pro Pro Ile Arg Lys Ser
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Glu Lys Phe Lys Tyr Asp Phe Pro Arg Tyr Arg Leu Met Arg Ile Met
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Asp Thr Gln Glu Ala Ile Ala Gly Thr Ala Cys Asp Met Asn Ala
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<210> 64

<211> 1429

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 64

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tacaccagga tcctacaatc cggataatat gatcagtacg gcttttgcct acgatgctga 180

gggtgaaaaa ctcttcctag ctgtcccaag gaagttaccc agagttccgt atacattggc 240

ggaagtggat acaaagaata gtcttggtgt taagggaata cattcaccgt tacttaacaa 300

attcagtggg cacaaaactg ggaaggaact aacatcaatc tatcagccag ttattgatga 360


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<210> 65
<211> 170
<212> PRT
<213> Lutzomyia longipalpis

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<400> 65

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Tyr Val Leu Gly Glu Thr Cys Ser Asn Ala Lys Val Lys Gly Ala Thr
          20          25          30

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Ser Tyr Ser Thr Thr Asp Ala Thr Ile Val Ser Gln Ile Ala Phe Val
          35          40          45

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Thr Glu Phe Ser Leu Glu Cys Ser Asn Pro Gly Ser Glu Lys Ile Ser
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Leu Phe Ala Glu Val Asp Gly Lys Ile Thr Pro Val Ala Met Ile Gly
65 70 75 80

Asp Thr Thr Tyr Gln Val Ser Trp Asn Glu Glu Val Asn Lys Ala Arg
85 90 95

Ser Gly Asp Tyr Ser Val Lys Leu Tyr Asp Glu Glu Gly Tyr Gly Ala
100 105 110

Val Arg Lys Ala Gln Arg Ser Gly Glu Glu Asn Lys Val Lys Pro Leu
115 120 125

Ala Thr Val Val Val Arg His Pro Gly Thr Tyr Thr Gly Pro Trp Phe
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Asn Ser Glu Ile Leu Ala Ala Gly Leu Ile Ala Val Val Ala Tyr Phe
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<210> 66

<211> 712

<212> DNA

<213> *Lutzomyia longipalpis*

<400> 66

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<211> 73

<212> PRT

<213> Lutzomyia longipalpis

<400> 67

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Asp Tyr Tyr Ile Thr Glu Gly Tyr Asp Gly Val Lys Glu Lys Arg Glu
 35 40 45

Ile Glu Leu Val Pro Val Thr Phe Gly Ile Phe Asn Ile His Thr Thr
 50 55 60

Pro Ala Pro Arg Ile Thr Phe Glu Trp
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<210> 68

<211> 379

<212> DNA

<213> Lutzomyia longipalpis

<400> 68

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<210> 69

<211> 76

<212> PRT

<213> Lutzomyia longipalpis

<400> 69

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Cys Ile Glu Thr Val Lys Ala Met Glu Ala Thr Glu Glu Ile Ser Val
 20 25 30

Lys Leu Gln Asp Asp Ala Asn Glu Pro Asp Asp Ser Leu Asp Leu Asp
 35 40 45

Glu Gly Leu Pro Asp Ala Phe Asp Glu Asp Tyr Asn Asn Gln Ala Glu
 50 55 60

Tyr Lys Pro Asn Pro Arg Gly Asp Tyr Arg Arg Arg
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<210> 70
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 <212> DNA
 <213> Lutzomyia longipalpis

<400> 70
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<210> 71
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 <212> DNA
 <213> Artificial sequence

<220>
 <223> Oligonucleotide primer

<400> 71
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<210> 72
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 <212> DNA
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<400> 72
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<210> 73

<211> 24

<212> DNA

<213> Artificial sequence

<220>

<223> Oligonucleotide primer

<400> 73

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24